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The Global One Health Environment

A Learning Module edited by 1HOPE-GPA
(Governance, Policy, Advocacy)

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THE GLOBAL ONE HEALTH ENVIRONMENT

The first edition of the framework for a Learning Module on Continuing Environmental Education (CEE) for postgraduate scholars, guided by their academic teachers: a compilation from the literature

Between animal and human medicine there are no dividing lines nor should there be. The object is different but the experience obtained constitutes the basis of all medicine.
Rudolf Virchow

Contributors in alphabetic order:

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Short overview

The learning module has been prepared by members of the Working Group 1HOPE-GPA (Governance, Policy, and Advocacy), part of the One Health for One Planet Education (1HOPE) Initiative to support learning and teaching about the environmental status of the planet. It aims at fostering interaction between inclusive governance and environmentalist activities in the community. This is developed in five chapters, each with several sections. The chapters cover learning material on 1) The Global interdependence 2) Environmental sustainability, 3) Toward multilevel education, 4) An approach to implementation, followed by 5) Guidance for organizers and lecturers. The Learning Module provides suitable study material for postgraduate students under the guidance of their lecturers whereas the final chapter outlines the possible institutional organization of the Learning Module.

Keywords

Advocacy, action, community, decision making, environmental health, globality, governance, module organization, One Health, policy, public health, Wellbeing.

Acknowledgements

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External reviews

1) Judith W. Overall, MEd, MSc, JD

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Need and Timeliness of the Module: The need for this module and similar ones has been growing exponentially for some time, but now has reached an even more "time is of the essence" situation with the advent of COVID-19 and its cross-cutting, global impact. It is no longer the situation that One Health, for example, is an idea many have believed was within the realm of academics and researchers only or expounded by groups of idealists or doomsday prophets. Now we see on an everyday basis what can happen when something as small as the COVID-19 vector, though entering the human population via an animal vector silently and slowly at first, has the capability to bring the global population, its health and economic systems along with it, to its knees. Most of us do not need scientists, academics, researchers and others to tell us what can happen in our everyday lives that the population in general did not imagine or grasp not so long ago, as the virus continues its often-deadly circumnavigation of the globe because we can see with our own eyes what is happening to our loved ones, to our livelihoods and ability to feed and clothe our families in many instances, even in countries with higher income levels, GDPs, and advanced health care systems. Yet there are those who advocate that the virus is a hoax - a dark force working through world leaders who do not tell the truth and therefore whose warnings or protective measures do not have to be followed. We have reached the point of literally "the perfect storm" that highlights the crossroads of the myriad professionals described in the One Health agenda who are necessary for combatting the virus, ranging from the scientists and researchers, to the health (human and animal; physical and mental; public health) practitioners, to the academics and teachers, to the business leaders, to logistics and data experts and epidemiologists, to environmentalists, to the legal practitioners and human rights experts, and many more. What is often left out in discussions or not defined is the crucial role of those who set policy and whose job is to govern in the midst of all that is happening. We have arrived at the "What do we do now?" moment.

COVID-19 is of course not the only event or scenario which illustrates in real time what the One Health Agenda and education advocates. It, including all its ramifications, is the most pressing one now. It underscores the need for the type of education and training such as 1HOPE. It also vividly underscores and highlights the fact that more focus is needed on the governance and policy components and the professionals who must perform the decision-making and administrative tasks. Without competent leaders who can govern effectively and equitably in the midst of a pandemic situation, for example, there is little hope of reaching the outcomes that we seek. This module, produced by the 1HOPE-GPA (Government, Policy, and Advocacy) Working Group, is sorely needed.

Appropriateness of content of materials for target audience: Target audience: postgraduate scholars; continuing education scholars; guided by academic teachers

- Content level is appropriate for persons who are at postgraduate or continuing education level; because of the wide variety of professions required for ultimate success of the One Health agenda, some of the postgraduate level or continuing education levels will have more background knowledge and prior understanding of the One Health concept than others whose prior training does not include the same familiarity with some of the foundational information included in the module.
- Content is useful from the viewpoint of an academic
- Because there is a wide variety of potential users of the module who have divergent backgrounds, it is important that foundational/basic information is included in the introductory sections and then mentioned or applied later on throughout the module.
- The materials can be useful for academic teachers as well as they guide the postgraduate or continuing education students through the module.
- Inclusion of the recent cases/case studies describing the situations, challenges, responses, need for collaboration across the spectrum of professionals who must be involved if at all possible, and the outcomes of those responses to COVID-19 in two separate countries strengthens the information in the module's introductory materials.
- As the world watches the ravages of COVID-19, we are seeing in real time the interactions of the environment; vectors; medical education, both human and animal (and the integration thereof); medical, veterinary, public health research; the economy; discrimination in treatment and access to vaccines, and the list goes on.
- Likewise, the case/case study explaining a different topic (education: two schools under one roof) presents the many issues that arise from the situation as well as the issues that caused it and the repercussions of continuing. Its discussion of the many players, including policy makers at various levels, further highlights the problems, showing that decisions by policy makers alone often cannot solve such deeply-seated issues, of which education per se is one of many. It also raises the question of how education and discrimination relate to One Health and the One Health agenda and vice-versa.
- The module also provides useful information and explanation of other important issues and professionals under the umbrella of One Health activities and education: civil society; social inclusion; prosperity; peace and non-violence, environmental sustainability, including biodiversity and climate change, along with sources for studies and exercises in environmental health and health risk assessment; the One Health and Wellbeing Concept, for example.
- Education per se is discussed: multilevel education One Health and Wellbeing Education, with a country case study showing the development of One Health education is included; a guide for One Health Action along with other guidance regarding "What can we do" are presented; finally, there are suggestions for organizers and lecturers regarding modules: structure and content, organization, learning methods, expected outcomes and competencies, target groups and documentation.

2) Professor Milena Santric Milicevic MD, MSc, PhD

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In recent decades, interactions between humans, animals, and the environment impact global public health. Understanding the animal-human-ecosystem interface is needed to addressing the burden and ensure sustainable planetary development. Proper understanding is at the heart of One Health's problem-solving action that brings together joint, multisector, and interdisciplinary efforts at the local, national, regional, and global levels for an optimal human, animal, and environmental Wellbeing. The One Health approach's scope is embraced by many global agencies (such as World Health Organization, UNICEF, the World Bank World Organization for Animal Health, Food and Agriculture Organization, etc.) and international and national organizations. Every year, on November 3, various educational and awareness-raising events mark One Health Day worldwide. It is time for traditional curricula for medical and public health disciplines to adopt the One Health approach to develop competencies and enable professionals to responsively build on the benefits of human-animal-ecological interaction and use opportunities to avoid, mitigate and reverse its risks.
An international group of experts has teamed up to facilitate innovating postgraduate and continuing education by developing a “Framework for a Learning Module on Continuing Environmental Education (CEE): The Global One Health Environment.” This framework enriches the learning about global interdependence, environmental sustainability, multilevel education, and action. The framework of the learning module's broad chapters focus on defining One Health's concepts through a historical review of the leading global and regional initiatives and local case studies and by emphasizing the needed transformations, tools, and resources to meet the commonly seen resistance and human made failures. A collection of definitions, up-to-date standing points, activities, indicators, and research questions is illustrated and presented to help the creation of a critical thinking and actionable position for advocacy, planning, and action on the various issues including inclusive governance, informed civil society, prosperity and social inclusion, peace and violence, climate change and biodiversity, and multilevel One Health and Wellbeing education. This framework uses an innovative approach to demonstrate the Guide to One Health Action and highlights what can be done within the available resources. Finally, it also outlines the possible organization of learning modules, assisting academic teachers by referring to guidelines for theoretical and practical lessons, sources of case studies on real-world problems from low-, middle- and high-income countries, and exercises and relevant readings. "The Global One Health Environment Framework" is a valuable title for anyone seeking to increase literacy and engagement in the One Health program.

Table of Contents[1, 2]

[1] Figures and tables are enumerated for each section separately; the references are listed as well in each section separately in alphabetic order, with the exception of the reprints in sections 1.6, 1.7, 3.1 and 3.3. Cited text is usually set as 'text', full citations are set as "citation".

[2] Up to 8th of March 2021 the following chapters have been summarized and annexed in a separate file as power point slides: Introduction, 1.1, 4.2, 5.0.

2.0 Environmental Sustainability

2.1 Climate change and biodiversity (Veronica Ormea, Richard Seifman)

2.2 The One Health & Wellbeing concept (Veronica Ormea)

2.2.1 Policies in One Health

2.2.2 Ecosystem and human Wellbeing

2.2.3 Smart cities, green buildings

2.3.4 Available tools

2.2.5 Conclusions

2.3 List of possible exercises and case studies on environmental health risk assessment

3.0 Toward multilevel 1 HOPE education and transdisciplinary research

3.1 Toward One Health & Wellbeing education (George Lueddeke; reprint)

3.2 Study on Academic One Health education in Japan (Tomiko Hokama, Ulrich Laaser)

3.2.1 Introduction

3.2.2 National Action Plan on Antimicrobial Resistance

3.2.3 Fukuoka Declaration and its implication

3.2.4 One Health approach and cooperation system of physicians and veterinarians

3.2.5 Challenges in academic One Health education

3.2.6 Overview summary

3.3 A code of ethical conduct for the public health profession (Ulrich Laaser, Peter Schröder-Bäck, Eliudi Eliakimu, Kasia Czabanowska and Think-Tank for Sustainable Health & Wellbeing (GHW-2030); reprint)

4.0 An approach to implementation

4.1 A Guide to One Health action (Richard Seifman)

4.1.1 An operational vision for One Health

4.1.2 Institutional arrangements at country level

4.1.3 Stakeholders

4.1.4 Methods and tools for operationalizing One Health

4.1.5 Integration into planning

4.1.6 Indicators, monitoring and evaluation

4.1.7 Putting it all together

4.2 What Can We Do to Improve One Health? (Ulrich Laaser)

4.2.1 Identify unsustainable behaviors and barriers to change; suggest innovative action

4.2.2 Understand various commitment strategies

4.2.3 Communicate effective messages

4.2.4 Enhance motivation and invite participation

5.0 Guidance for Organizers and Lecturers (Ulrich Laaser)

5.1 Structure and content

5.2 Organization

5.3 Learning methods

5.4 Expected outcomes and competencies

5.5 Target groups

5.6 Documentation

6.0 Short Curricula Vitae of Contributors

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Abbreviations

AI	Artificial Intelligence
AMA	American Medical Association
AMR	Antimicrobial Resistance
AMS	Antimicrobial Stewardship
AVMA	American Veterinarian Medical Association
BiH	Bosnia & Herzegovina (Federation)
BMC	Brihan Mumbai Corporation (India)
CC	Conscious Capitalism
CCC	Corona Care Centre (India)
CCC SLOs	Common Core Curriculum based on Student Learning Outcomes
CDC	Center of Disease Control (USA)
CE	Continuing Education
CEO	Chief Executive Officer
CHV	Community Health Volunteers
CO	Containment Officer (India)
CO2	Carbon Dioxide
COVID-19	Corona Virus Disease 2019
CSO	Civil Society Organization
DCH	Dedicated COVID Hospital (India)
DCHC	Dedicated COVID Health Centre (India)
DPSEEA	*Drivers, Pressures, State, Exposure, Effects, Actions*
DrPH	Doctor in Public Health
ECTS	European Credit Transfer System
EHI	Environmental Health Indicators
EU	European Union
FAO	Food and Agriculture Organization
FDA	American Food and Drug Administration
FETP	Field Epidemiology Training Program
FTSE	Financial Times Stock Exchange 100 Index
GCOH	WVA - WMA Global Conference
GHW-2030	One Health Global Think-Tank for Sustainable Health & Well-being (GHW 2030)
GS	Gaza Strip
G20	Group of governments and central bank governors from 19 countries and the EU
GCOH	Global Conference on One Health
IAPM	Identify-Analyze-Prioritize-Manage
IAWG-Costing	Inter Agency Working Group on Costing
ICCC	International Center for Climate Change
ICU	Intensive Care Unit
IHR	International Health Regulations

ILO	International Labor Organization
IPC	Infection, Prevention and Control
IPCC	Intergovernmental Panel on Climate Change
IPPC	International Plant Protection Convention
JACME	Japan Accreditation Council for Medical Education
JEE	Joint External Evaluation
JMA	Japan Medical Association
LMICs	Low and Middle Income Countries
JVMA	Japanese Veterinarian Medical Association
MAFF	Japanese Ministry of Agriculture, Forestry and Fisheries
MASARAT	Palestinian Center for Policy Research and Strategic Studies
MDG	Millennium Development Goals
MERS	Middle East Respiratory Syndrome
MEXT	Ministry of Education, Culture, Sports Science and Technology (Japan)
MHLW	Ministry of Health, Labor and Welfare (Japan)
MOE	Ministry of Environment (Japan)
MoEPP	Ministry of Environment and Physical Planning (North Macedonia)
MOFA	Ministry of Foreign Affairs (Japan)
MoH	Ministry of Health
MoHFW	Ministry of Health and Family Welfare (India)
NAOR	Nippon Antimicrobial Resistance (Japan)
NCD	Non-Communicable Diseases
NGO	Non-Governmental Organization
OECD	Organization for Economic Cooperation and Development
OH	One Health
OHC	One Health Commission
OHCHR	Office of the High Commissioner for Human Rights
OHI	One Health Initiative
OIE	World Organization for Animal Health
ONE HOPE - G PA	1HOPE - Government, Policy, Advocacy
OSCE	Organization for Security and Co-operation in Europe
PCR	Polymerase Chain Reaction (COVID-19 test)
PH	Public Health
PNA	Palestinian National Authority
PLO	Palestine Liberation Organisation
PPP	Public Private Partnership
PVS	Performance of Veterinary Services Pathway
SARS	Severe Acute Respiratory Syndrome
SDGs	Sustainable Development Goals
SDPs	Sustainable Development Pathways
SRA	Slum Rehabilitation Authority
TWI	The World in 2050 Initiative

UDHR	Universal Declaration of Human Rights
UHC	Universal Health Coverage
UN	United Nations
UNCT	United Nations Country Teams
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNRWA	United Nations Relief and Works Agency (for Palestine Refugees in the Near East)
US	United States of America
USAID	United States Agency for International Development
WB	World Bank
WMA	World Medical Association
WVA	World Veterinarian Association
WFME	World Federation of Medical Education
WHO	World Health Organization
WWF	World Wildlife Fund

Introduction to One Health

Yehia Abed, Madhumita Dobe, Eliudi Eliakimu, Rusmir Goletic, Tomiko Hokama, Ulrich Laaser, George Lueddeke, Linda Mans, Veronica Ormea, Monalisha Sahu, Richard Seifman

This learning module has been prepared by members of the Working Group 1HOPE-GPA (Governance, Policy, and Advocacy), part of the One Health for One Planet Education (1HOPE) Initiative (Kaplan 2021) to support learning and teaching about the environmental status of the planet. The Working Group's name **"1HOPE – GPA"** (**G**overnment, **P**olicy, **A**dvocacy) refers to the One Health concept and the key role of effective interaction between experience on the ground i.e. the informed civil society, and political decision processes i.e. inclusive Governance comprising Government, Policy and Advocacy - bottom-up and top-down, both supported by an interactive science **(Figure 1)** (Laaser 2015, Laaser et al. 2016). Practice on the ground should help to influence the governing level and the resulting changes towards a more responsive and inclusive governance. On the other hand governance should secure initiation and support of an active and well-informed practice widening its scope and coverage. This process includes multiple professional sectors, inter alia: mechanical engineering, pharmaceutical industry, economists, and agriculture including forestry, education, veterinarians, physicians, political advocates, journalists, IT-technologists and multiple other sectors of development. Also, the multiple professional sectors' involvement must include the often-neglected areas of legal aspects, sociology, and ethics in which we need to go beyond the bioethics and include the issues of environmental and biodiversity ethics, social science ethics, and aspects of rights (human, animal). To this end, legal experts, sociologists, and experts in ethics should be included in the implementation of One Health (Destoumieux-Garzón et al. 2018). As demand for quantitative projections of future climate change from the scientific community, policy makers, and other stakeholders increases, involvement of professionals with expertise in statistical modeling is a must (Collins et al. 2012). This complex amalgam of expertise is predominantly oriented on three interrelated concepts: Global health which underlines the steep gradients in human health between rich Western countries and e.g. impoverished sub-Saharan countries in Africa; public health which targets population health and the essential service infrastructure; and planetary health which targets the ecosystem as an interdependent and interactive system of air, water, land, plants, animals and humans. One Health tries to keep these views on the destiny of mankind together.

The One Health notion can already be found in the writings of the physician Hippocrates (460 BCE – 367 BCE) and Aristotle (384 BCE – 322 BCE) (Evans et al. 2014). The One Health ideas of today constitute a reconceptualization of health management in response to the exponentially accelerating environmental changes of the past 100 years, associated with the parallel exponential growth of global human population (Evans et al. 2014). The classical One Health concept was derived originally from increasing concerns about infections through animals. However, in the early 21st century (Paris Agreement of 4th November 2016) it developed into a framework of thinking about the Earth as a home for animals, plants and mankind in a common environment of air, water, and land - the planet Earth as Noah's Ark, told in the heritage of mankind (Genesis 6, 12, 13 & 19 20): **"**God saw how corrupt the earth

had become, for all the people on earth had corrupted their ways. So God said to Noah: …You are to bring into the ark two of all living creatures, male and female, to keep them alive with you. Two of every kind of bird, of every kind of animal and of every kind of creature that moves along the ground will come to you to be kept alive".

In 'Transforming our world: the 2030 Agenda for Sustainable Development' (UNFPA 2015) a supremely ambitious and transformational vision has been set out: 'A world free of poverty, hunger, disease and want, where all life can thrive…, where democracy, good governance and the rule of law as well as an enabling environment at national and international levels, are essential for sustainable development, including sustained and inclusive economic growth, social development, environmental protection and the eradication of poverty and hunger; and, a world in which development and application of technology are climate-sensitive, respect biodiversity and are resilient, a world in which humanity lives in harmony with nature and in which all living species are protected.'

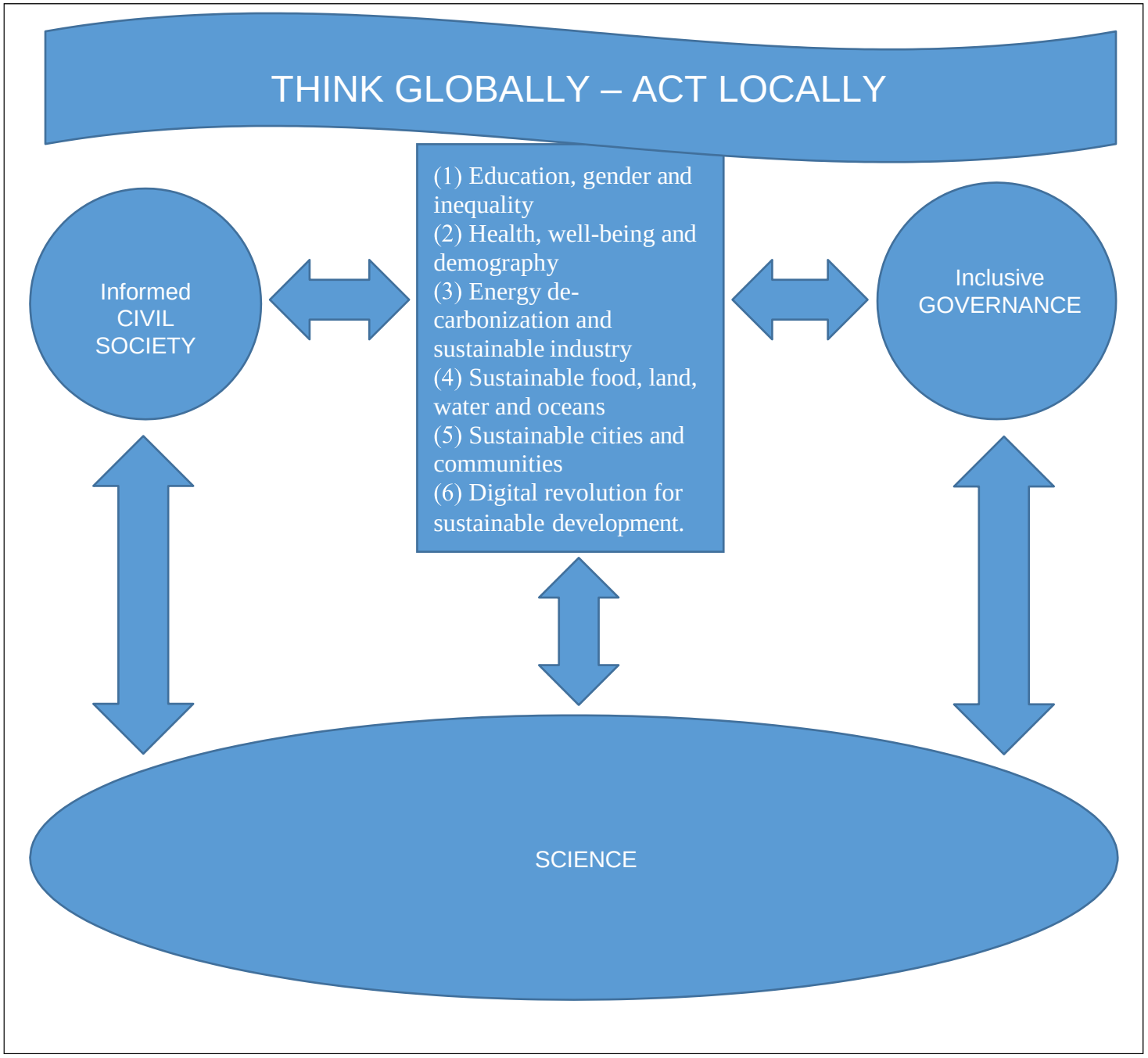
We have transgressed several planetary boundaries that regulate the stability of the earth system and ultimately a stable state of the planet. The current economic, social, and environmental trajectory, at the global scale and within most regions of the world, follows an unsustainable development path. THE WORLD IN 2050 (TWI 2050) initiative[3] identified in 2018 specific Sustainable Development Pathways (SDPs) how the objectives of sustainable development within planetary boundaries can be met:

- Human capacity and demography
- Consumption and production
- De-carbonization and energy
- Food, biosphere and water
- Smart cities
- Digital revolution

In **Figure 1** a more recent version of the Pathways is inserted: The Six Transformations (Sachs et al. 2019) to achieve the Sustainable Development Goals in 2030 and the wider perspective of a sustainable future in 2050.

[3] TWI2050 inspires the structure and main messages of this learning module.

Figure 1:
Interaction between civil society and governance to advance the Six Transformations.



The six transformations as well as the older pathways are based on the conviction that rather than investigation of the role of water, or food, or energy, or even the water-food-energy nexus a strategic concept should truly integrate all possible domains affected and focus on tradeoffs and co-benefits to be able to generally take a holistic perspective that is at the core of 2030 Agenda'. A historical line can be drawn from the Universal Declaration of Human Rights in 1948 to the warning signal of the Club of Rome in 1972 (Meadows et al. 1972) and the Brundtland-Commission in 1987 (UN, 1987) with the concept of intergenerational responsibility, crowned by the Millennium Development Goals (WHO 2000) which were adopted by all UN member states in 2000.

The trajectory of sustainable development into the future requires economic, social, and environmental stability - together at a pace sufficient to achieve the targets in 2030 and 2050. TWI2050 identifies 5 major challenges for this three-dimensional sustainability which are deeply embedded in our societal structures and will prove extremely difficult to change:

(a) Multidimensional poverty: hunger, malnutrition, deficient health care;
(b) Rising inequalities of material resources and education;
(c) Degrading of the physical environment;
(d) Demographic stresses: high fertility, accelerated urbanization, rapid aging;
(e) Deficits of governance resulting in migration and rising nationalism.

Correspondingly one can identify major resistance against essential improvement:

a) Vested interests, specifically owners of fossil fuels resisting the move to zero-carbon energy, and beneficiaries of unsustainable land and ocean practices as e.g. land clearing and deforestation, overfishing the oceans.
b) Major wealth owners avoid successfully taxation.
c) Limited capacity of governments to plan and implement policies with time scales of decades because of the short political business cycle and the lack of strong planning units supported by universities, and think tanks.
d) The difficulty of a suitable balance in public private partnerships (successful lobbying vs. strangulation of initiative).
e) An ill-informed public develops fear and resistance to change leading to 'status quo biases'.

To respond to the challenges and overcome resistance, human society must be placed at the center of the sustainability debate. For many years sustainability issues were principally the domain of the natural and life sciences. Now they are studied as socioenvironmental system dynamics in order to mitigate the consequences of human behavior, together with an area which might be called social psychology aiming at human behavior itself: The real sustainability challenge is essentially societal and individual behavior, not environmental! However, in addition instead of focusing (ex post) on the origins of dynamics, we must (ex ante) study the emergence of novelty - the future that we want - acknowledging the fact that multiple futures can emerge at any point in a system's trajectory. We have to determine what kind of future is

plausible and desirable (Bai et al. 2016). Apart from resistance, Nunes et al. (2016) noted that despite the UN member states enacting the SDGs, there was no an integrative framework to operationalize the three dimensions of sustainable development – the social, environmental and economic; therefore, they proposed a framework for that which places health and Wellbeing as both preconditions and outcomes of sustainable development.

One of the key problems in policy-making in the 21st century is dealing with uncertainty and that the process has become more complex as it attempts to address "wicked problems" and systemic risks, confronting multiple possible futures. Nowadays decision-making includes many players and stakeholders to reach agreement on courses of action. Exacerbating policy-making in the 21st century is the fact that the amount of evidence is always increasing and it is rarely final. This difficulty to forecast with a sufficient degree of reliability constitutes a major problem for political and administrative decision-makers as usually they are hesitant to make decisions in a state of uncertainty and have no incentive to go beyond their field. Addressing complex social issues based on separate responsibilities and not on teamwork across sectors does not pay justice to 'the interactions between causal factors, conflicting policy objectives and disagreement over the appropriate solution.' (Kickbusch 2012).

One of the key themes in the book, Global Population Health and Wellbeing in the 21st Century: Toward New Paradigms, Policy and Practice (Lueddeke 2015), is that in terms of global health and Wellbeing the early decades of the 21st century must pave the way for a new way of thinking about the planet and each other. The 20th century 'vision that infectious disease had been conquered, and that through basic scientific understanding, advanced technology and unlimited electrical power, humanity had somehow been freed from the bonds of nature is clearly demonstrated to be an illusion (Lueddeke 2015; Lueddeke 2019). The emergence of three deadly infectious diseases caused by spillover of animal coronavirus to humans within two decades – the Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), and the coronavirus disease pandemic of 2019 (COVID-19) has proven us to be wrong (da Costa et al. 2020, Fauci et al. 2020, Gorbalenya et al. 2020, Hartley et al. 2020). Some scientists have attributed emergence and transmission of infectious diseases to biodiversity loss, which may affect transmission in terms of "changing the abundance of the host or vector; the behavior of the host, vector or parasite; and the condition of the host or vector (Keesing et al. 2010). Key questions in this context are, for example (integrated from Lueddeke 2015; Waltner-Toews 2008):

- What socioeconomic and geopolitical changes would be needed to adopt the view that business should serve not dominate our world?
- How to re-conceptualize global priorities, policies and practice, and needed societal transitions in terms of human behavioral change?
- What might be promising models of change translating into policy outcomes - criteria and strategies?
- What are some of the main obstacles in gaining support at local, national and regional levels? How might these be addressed?

- To what extent could policy-makers mutually learn from identical faulty assumptions with regard to non-communicable diseases and conditions, and the development of multi-sectoral and integrated policies?
- How might the 'One World, One Health' concept act as a transformative, potentially epoch-defining approach to ensure the future sustainability of life on the planet?

What may be a decisive dimension is 'Globalism'. Although each country or group of countries must find its own priorities, direction and pace (the traditional scenario), each of such choices has global implications in terms of conditional determinants and of global effects in a future scenario. People become increasingly 'place-less' with other, non-territorial modes of organization emerging (e.g. e-residency in Estonia from anywhere in the world). Globalism support our understanding of an interdependent world but has also the potential to undermine societal cohesion, the multidimensional value systems that keep communities together (Polanyi, 1944), and: there is not much time left!

One way of addressing the pressing challenges for the 21st century is to engage in interdisciplinary research programs in a One Health approach in order to generate evidence for decision making and to prevent future global catastrophes (Amuasi et al. 2020, Charlier et al. 2020). Another aspects that can assist in tackling the resistance is to increase connections between One Health science and global health security, which will help to elevate attention on One Health science within governments and international institutions which ultimately can increase inter-sectoral collaboration (Osterhaus et al. 2020). Also, universities need to be supported to provide better education and develop capacity to support students who will be affected by their realization of the impact of the effects on climate change and other environmental challenges affecting human health. For example, Godsmark (2020) has noted that students who realize what the world is facing from climate change such as global warming and global emissions during lectures may present with mental health symptoms such as "*solastalgia, ecological grief, and eco-anxiety or pessimism*". Thus universities need to have support systems for them and the lecturers need to be empowered to handle such situations.

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1.0 The Global Interdependence

The six major transformations for sustainable development, as shown in Figure 1 of the introduction, require inclusive governance structures. Taking the 2030 and even more so the 2050 agenda seriously implies that, incremental change is not any more an option, transformative governance is needed (TWI2050), organized in the format of a governmental planning unit or an inter-agency task force chaired by a member of the cabinet: 'Financial investment has to be increased**,** however, achieving the necessary transformations will be no more than 4% of global output per year. The key is to raise national saving rates by a few percentage points of national income and invest the incremental saving on priorities such as zero-carbon energy, high-quality schools, improved health systems, environmental conservation and restoration, good governance institutions, and global cooperation initiatives to leverage dynamics towards the implementation of the SDGs'.

1.1 Governance (Ulrich Laaser)

Sir Donald Acheson coined in 1988 the most often cited definition of public health: 'Public health is the science and art of preventing disease, prolonging life and promoting health through organized efforts of society' (Acheson, 1998, WHO 2012). These ends are optimized, according to the Commonwealth Secretariat (The Commonwealth 2015), when they are founded 'upon evidence based knowledge and enabled by good governance, advocacy and the capacity to ensure fair, secure and sustainable health and Wellbeing for all'. The basis for all of that is governance.

Governance has been defined as 'the process through which governments and other social organizations interact, relate to citizens and take decisions in an increasingly complex and interdependent world. It differs across political systems, with many ways in which individuals and institutions, public and private, manage their common affairs' (Commission on Global Governance, 1995).

The World Bank widens the spectrum of governance decision-making processes to include the process by which governments are selected, monitored and replaced, specifically mentioning government's capacity 'to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them' (World Bank Group 2015).

From "Good" to "Inclusive" Governance:
In international development debates, we are currently observing a shift away from the notion of good governance to inclusive governance. Although good governance is still widely used to assess the quality of governance processes and government performance (the keywords being accountability, transparency, effectiveness, efficiency, government responsiveness), practitioners and scholars criticize the hitherto prevailing concept of good governance because it does not capture all attributes that are necessary to build equal societies in which 'no one is left behind'. While good governance implies effective government for sustainable development

outcomes, recent studies address the need to include the distribution of policy outcomes. In this sense, political institutions must be inclusive and able to redistribute public goods and foster equality between the people in sense of inclusive governance (Acemoglu et al. 2012). In its recent World Development Report "Governance and the Law", the World Bank emphasizes that the distribution of political power drives institution-building and the distribution of policy outcomes (World Bank Group 2017). The Bank concludes that building capacities is important but not sufficient unless power constellations are taken into account. By adopting SDG 16 on peace, justice and strong institutions and SDG 10 on equality, as well as the guiding principle of "Leave no one behind", the UN 2030 Agenda for Sustainable Development responds to these debates and to a critical gap identified over the process of MDG implementation. This strong emphasis placed on the achievement of peaceful societies, general reduction of violence, inclusion and social justice through adequate governance constitutes a veritable shift in the global development agenda. Although the importance of good governance was cursorily mentioned in the Millennium Declaration, no specific MDG was developed to focus attention and resources on governance issues, let alone the question of political inclusion. Recently a broader consensus developed, that the governance targets under SDG 16 are not merely desirable development outcomes, but need to be understood as indispensable enablers for achieving all other goals (e.g. Sachs 2015). Although there is a common agreement amongst states about the need to properly govern the implementation of the SDGs (Kanie et al. 2017), the concept of governance is still contested and more time will be needed to see whether the notion of inclusive governance will effectively replace the current concept of good governance. Egalitarian societies rely on inclusive institutions which allow for innovation, prosperity and Wellbeing (WHO 2011).

'Governance of Health' may be understood 'as the attempts of governments or other actors to steer communities, countries or groups of countries in the pursuit of health as integral to Wellbeing through both a whole-of-government and a whole-of-society approach. 'Governance for health promotes joint action of health and non-health sectors, of public and private actors and of citizens for a common interest. It requires a synergistic set of policies, many of which reside in sectors other than health as well as sectors outside of government, which must be supported by structures and mechanisms that enable collaboration. It gives strong legitimacy to health ministers and ministries and to public health agencies, to help them reach out and perform new roles in shaping policies to promote health and Wellbeing'. (WHO 2011, Laaser et al. 2015).

In the Western Countries advancements in human health were critical for the human "Great Escape" out of poverty over the past 250 years (Deaton 2013). However, many recent health gains resulted from exploitation of natural resources, particularly for food and energy provision. The required correction of this unsustainable path must be based on the most important asset of good governance, the public's confidence and trust: if lost the costs can be very high. This applies also to the public's confidence in scientific conclusions. The starting point is public awareness, often initiated by civil movements preceding governmental action by decades (e.g. Nelson Mandela for civil rights). Admitting that a de-growth scenario is at least for the moment impossible, instead we have to try to mitigate the consequences or our

current dynamics (Hickel et al. 2019). The example in case is the carbon dioxide (CO2) mitigation. Can we extend it to other fields and what would it take - scientifically, politically, and economically? The real danger is that a collision between several non-linear tipping points will generate unpredictable disruptions, leading to a period of global chaos, accelerated by rapid technological change, such as the ICT revolution (SDG Transformations Forum 2018).

There are three instruments an inclusive government can employ:

(a) Public deliberation (e.g. public 'town hall' meetings, surveys)
(b) Scientific task forces
(c) Wide-ranging public private partnerships.

To operationalize the three areas effectively it seems imperative that we adopt a complex adaptive systems approach to sustainability issues, looking at societal processes bottom-up, identifying the behavior of individuals and of the different groups and networks that constitute societies (TWI2050). This approach will provide a different perspective on the dynamics driving us in an unsustainable direction, and will thus facilitate designing different trajectories to achieve our goals. The ICT (Information and Communication Technology) revolution is on the brink of enabling mankind to do so, as the combination of 'Big Data', high-performance computing, the cloud and machine learning together enable us to move forward at unprecedented speed (Zuboff, 2020).

Their report, The political origins of health inequity: prospects for change (The Lancet Oslo Commission 2014), identified five main dysfunctions of global governance that allow adverse effects of global political determinants of health to persist, and which, arguably, could apply to other SDG areas; A new global governance structure might build on the 'power asymmetries', identified by The Lancet-University of Oslo Commission of Global Governance for Health.namely,

- lack of participation of key groups in decision-making processes;
- inability to constrain power;
- norms, rules and decision-making processes that undermine change;
- inadequate policy-making arenas; and
- absence of international institutions to protect and promote health.

According to a conclusion of the review of 'Health and Environment Decision-making in Developing Countries' (UNEP & WHO 2004), the primary barriers to more effective policy are neither a lack of evidence nor a lack of knowledge. They are most often economic, institutional, political and social (see **Box** for the essential questions to be answered urgently by politics and science).

Box: Essential questions requiring urgent answers

- What are some of the main barriers that must be overcome by 2030 to make significant progress toward the SDGs in each area?

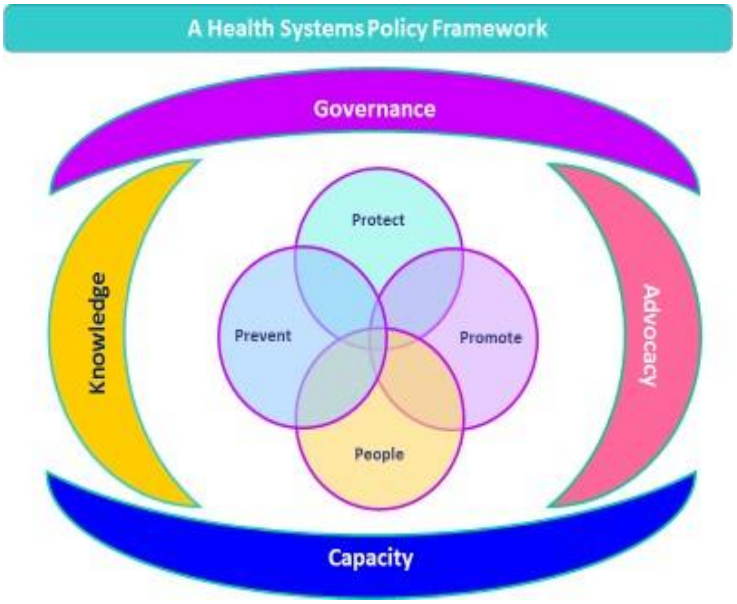
- Are the governance structures in place capable of nurturing major societal paradigm shifts and progress the SDGs at global, regional, national and local levels?

- Guided by a Health Systems Policy Framework, in which ways might a 'new people, planet and prosperity' structure tackle the 'power asymmetries', mentioned before, such as social and economic inequalities?

- How can the significant paradigm shift required to move in these directions be brought about in order to ensure human health and well-being 'without exceeding sustainability limits and planetary boundaries'?

In **Figures 1.1/1 and 1.1/2** below the actions of governments and other actors are summarized to bring together communities, countries or even several countries in the pursuit of health which is integral to Wellbeing through – a whole-of-government and whole of society approach. Figure 1.1/1 highlights the actions of the public health system, while Figure 1.1/2 highlights the decision-making processes behind the actions in Figure 1.1/1.

Figure 1.1/1: Key components of a health systems policy framework (Nurse et al. 2016)



Legend: The Headings and Sub-headings for a Health Systems Policy Framework:
1. Governance*:* public health legislation; policy; strategy; financing/funding; organization; quality assurance: transparency, accountability and audit.
2. Knowledge*:* surveillance, monitoring and evaluation; research and evidence; risk and innovation; dissemination and uptake.
3. Protection: International Health Regulation (IHR) and co-ordination; communicable disease control; emergency preparedness; environmental health; climate change and sustainability.
4. Promotion*:* inequalities; environmental determinants; social and economic determinants; resilience; behavior and health literacy; life-course; healthy settings.
5. Prevention*:* primary prevention: vaccination; secondary prevention; screening; healthcare management and planning.
6. People: primary health care; secondary health care; tertiary health care and rehabilitation.
7. Advocacy*:* leadership and ethics; community engagement and empowerment; communications; sustainable development.
8. Capacity*:* workforce development for public health, health workers and wider workforce; workforce planning: numbers, resources, infrastructure; standards, curriculum, accreditation; capabilities, teaching and training.

Figure 1.1/2: A health governance framework (Nurse et al. 2016)

Legend: The headings and subheadings for a health governance framework

2. Public Health legislation

Public health law including designation of public health functions, roles and responsibilities; includes cross-cutting legislation, and for specific topics like tobacco and alcohol control, salt reduction or food fortification; international, national, regional and local leadership roles; international health regulations and human rights agreements; regulations for environmental health and work, and for non-communicable diseases; public accountability and enforcement of legislation, including policing, and reporting systems.

3. Policy

Senior cross-governmental ministerial public health committees and working groups, supported by health advisors to embed public health across policy; health diplomacy and foreign policy for health security and to benefit health; development of cross-sector policy that benefits health, (health in all policies); development of health policy for public health; cross-sector Health Impact Assessments.

4. Strategy

Whole of society approaches, skills for strategy development; stakeholder engagement; public health information and health needs assessment with priority setting, using evidence-based and cost-effective interventions; service delivery and monitoring of outcomes.

5. Financing/funding

Appropriate funding sources assigned for the public health functions; ensure sustainable financing systems that protects public health services; public health financing includes raising funds, pooling and channeling of resources, and incentives to maximize efficiency, effectiveness and equity.

6. Organization

Clarify roles, responsibilities, outcomes and accountability of organizations delivering public health functions; ensure sufficient capacity to deliver services, functions and operations.

7. Quality assurance

Transparent and accountable processes are in place to improve outcomes and monitor processes to ensure effective, efficient, equitable, accessible, acceptable, safe, and sustainable services; undertake audits for quality improvement.

The Office of the United Nations High Commissioner for Human Rights (OHCHR 2015) reminds us that 'There is no single and exhaustive definition of good governance, nor is there a delimitation of its scope, that commands universal acceptance'. However, although how best to reformulate the term e.g. as 'inclusive governance' is presently still debated, OHCRH encompasses at least 13 key indicators of inclusive governance:

- full respect of human rights
- the rule of law
- effective participation
- multi-actor partnerships
- political pluralism
- transparent and accountable processes and institutions
- an efficient and effective public sector
- legitimacy
- access to knowledge, information and education
- political empowerment of people
- equity
- sustainability, and
- attitudes and values that foster responsibility, solidarity and tolerance

Overall, 'the true test of 'good' governance is the degree to which it delivers on the promise of human rights: civil, cultural, economic, political and social rights. The key question for the OHCRH is: are the institutions of governance effectively guaranteeing the right to health, adequate housing, sufficient food, quality education, fair justice and personal security?'

An important link exists between inclusive governance and human rights, which 'are mutually reinforcing.' On the one hand, 'Human rights principles provide a set of values to guide the work of governments and other political and social actors,' while, on the other, ' they also provide a set of performance standards against which these actors can be held accountable'. governance?

Key Links between inclusive governance and human rights are:

- Democratic institutions: participation 'in policymaking either through formal institutions or informal consultations' and establishing 'mechanisms for the inclusion of multiple social groups in decision-making processes, especially locally'.
- Service delivery: providing 'public goods which are essential for the protection of a number of human rights, such as the right to education, health and food'.
- Rule of law: reforming legislation and assisting 'institutions ranging from penal systems to courts and parliaments to better implement that legislation'.
- Anti-Corruption***:*** relying 'on principles such as accountability, transparency and participation to shape anti-corruption measures'.

Capturing key characteristics of the OHCHR, the World Bank Governance Indicators measure the quality of governance in around 200 countries, based on surveys and other country assessments of governance (World Bank Group 2019). These 'indicators combine the views of a large number of enterprise, citizen and expert survey respondents in industrial and developing countries', and 'are based on over 30 individual data sources produced by a variety of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms'. They are updated annually since 2002 and identify six key dimensions of governance:

- Voice and accountability
- Political stability and absence of violence
- Government effectiveness
- Regulatory quality
- Rule of law
- Control of corruption

The WHO provides guidance on how to implement smart public health policies in whole-of-government and whole-of-society approaches (WHO 2011):

- Governing by collaboration
- Governing through citizen engagement
- Governing by a mix of regulation and persuasion
- Governing through independent agencies and expert bodies
- Governing by adaptive policies, resilient structures and foresight.

Concluding comments

The urgency of transformation implemented by an inclusive governance is obvious in order to implement the six transformations described afore as the remaining time is limited, estimated to be not more than half a century.

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1.2 An informed civil society (Linda Mans)

In order to tailor the UN 2030 agenda for sustainable development to national contexts, reference has to be made to the document Mainstreaming the 2030 Agenda for Sustainable Development Interim Reference Guide to UN Country Teams (UN Development Group 2015; latest update 2017): 'It is designed as a reference guide for UN Country Teams (UNCTs), under the leadership of the UN Resident Coordinators, who wish to support Member States and national stakeholders in tailoring the 2030 Agenda for Sustainable Development to national contexts ("mainstreaming") while protecting its integrity.' As shown in **Figure 1.2/1**, the guide 'features an array of approaches and tools that UNCTs can discuss with Member States to adapt the SDG Agenda to national, sub-national and local conditions and realities, incorporating transnational perspectives where appropriate. These approaches and tools should be treated by UNCTs as a menu of options, with the case studies providing examples of how some countries have begun to develop and use relevant tools'.

Figure 1.2/1: Guide for implementing the 2030 agenda for sustainable development at national levels

The overarching aim of a revitalized global socioeconomic and geopolitical sustainability body should be to ensure 'the health and Wellbeing of the planet and its people'. Civil society could play a significant role in this process (Lueddeke 2015).

According to the World Health Organization (WHO, n.d.) 'civil society refers to the space for collective action around shared interests, purposes and values, generally distinct from government and commercial for-profit actors. Civil society includes charities, development

NGOs, community groups, women's organizations, faith-based organizations, professional associations, trade unions, social movements, coalitions and advocacy groups'. Located between government or the state and the market, it is, according to Gellner (1994) that 'set of non-governmental institutions, which is strong enough to counter-balance the state, and, whilst not preventing the state from fulfilling its role of keeper of peace and arbitrator between major interests, can, nevertheless, prevent the state from dominating and atomizing the rest of society.' Anheier (2017) has summarised four broad perspectives that position Civil Society Organizations (CSOs) in specific ways and determine their roles:

- CSOs are increasingly part of new public management approaches and what could be called a mixed economy of welfare with a heavy reliance on quasi-markets and competitive bidding processes.
- CSOs are seen as central to building and rebuilding the realm of civil society itself, and for strengthening the nexus between social capital and economic development.
- CSOs are part of a wider social accountability perspective that sees these organizations as instruments of greater transparency, and heightened accountability for improving governance of public institutions and business alike.
- CSOs are seen as a source of innovation in addressing social problems of many kinds.

Anheier states that in many instances, state-civil society relations have worsened, leading experts to speak of a 'shrinking space' for civil society nationally as well as internationally (Anheier 2017). We must therefore think of ways through which civil society can play a vital role in 'amplifying the voices of those who cannot be heard', advocating for more cooperation and social justice and inspiring the world with alternative and more equitable ways of doing things – i.e., how it can contribute to tackling the 'power asymmetries', such as social and economic inequalities.

According to the 2016 World Economic Forum (World Economic Forum 2016), initial priorities in the next 18 months and over the next 10 years involve such issues as:

- Involuntary migration
- State collapse or crisis
- Interstate conflicts
- Unemployment and underemployment
- National governance
- Water crises
- Climate change
- Extreme weather
- Food crises
- Social instability

Others that could be added, and some were included in the 2021 Global Risks Report (World Economic Forum 2021), are:

- Pandemics and epidemics
- Cybercrime and digital inequality
- Cultural inertia
- Investment and conscious capitalism
- Corruption
- Rebuilding national trust
- Growth in Wellbeing (vs. consumption)

As is obvious, none of these issues has been solved since and the COVID-19 pandemic is a loud warning siren. Mankind has to find a way out in order to survive. These priorities all impact global public health. Ottersen et al. (2011) argue that health concerns often center into conflict with powerful interests, e.g. national security, sovereignty, and economic power. What is needed to address the abovementioned priorities, and what the SDGs can provide because of their diversity and interconnectedness, is a framework for collaboration or a movement for health and social justice that goes beyond health. McCoy (2017) argues that the global health community, for example, needs to engage more fully with a range of under-represented disciplines and subject areas such as economics, international relations, trade, finance, law, geography and the earth sciences, but also, to engage politically and confront the politics of global health itself. According to McCoy, a more critical global health community would recognise the need to achieve global outcomes through local action, too. New economic models and re-democratisation, for example, are vital ingredients to the systemic change that is required to ensure the health and Wellbeing of the planet and its people. Along the same lines, Freudenberg (2014) emphasizes in his book 'Lethal but Legal' that harmful consequences of corporations on society, such as 'income inequality, subverted democracy, and environmental degradation, have been underemphasized by those working on health, limiting the potential for broader alliances'.

Civil society's advocacy includes for example voicing concerns about the direct threat that rapid and potentially irreversible climate change poses to global public health. Harmer et al. (2020) argue that one way to stimulate action would be for the WHO to recognise this threat in analogy to global disease threats. 'WHO could provide a strong signal by declaring climate change a public health emergency of international concern', they say and 'By doing so, it would protect and respect its mandate, global public health, the planet, and the Wellbeing of present and future generations; it would mobilise political will and funding needed for climate action; and it would convey the urgency of the reality of climate change that we now face.'

In the longer term, according to the authors of The Lancet paper, 'From sovereignty to solidarity: a renewed concept of global health for an era of complex interdependence' (Frenk et al. 2014), a fundamental change is required: 'the gradual construction of a global society…based on the principles of human rights and the logic of health interdependence'

whereby all stakeholders '...accept to share the risks, rights, and duties related to protection and promotion of the health of every member of this society'. The global community has to move from sovereignty 'to global solidarity and shared responsibility; sustainable and healthy development for all requires a global economic and political system that serves a global community of healthy people on a healthy planet'. The Lancet–University of Oslo Commission on Global Governance for Health concluded (Ottersen et al. 2014): Perhaps we can call it 'enlarged global health thinking' (free to Hannah Arendt's notion of 'enlarged thinking') (Mans 2018).

In support of such a new global economic system (and supporting/supportive political system), Raworth (2017a) provides in her book Doughnut Economics (Raworth 2017b) the doughnut model of social and planetary boundaries, which could serve as an apt visualization for such an enlarged global health thinking. Raworth shows how to 'improve humanity's Wellbeing while eliminating the social shortfall and ecological overshoot, and, at the same time, staying within the ecologically safe and socially just space in which people have the possibility to thrive'.

The inner ring of her doughnut model sets out the minimum people need to lead a good life, derived from the SDGs whereas the outer ring indicates the ecological ceiling. It must not be transgressed if severe ecological damages are to be avoided. 'The Doughnut implies the need for a deep renewal of economic theory and policymaking so that the continued widespread political prioritisation of gross domestic product growth is replaced by an economic vision that seeks to transform economies, from local to global, so that they become regenerative and distributive by design, and thus help to bring humanity into the Doughnut', Raworth argues (2017a). While following up on the findings and conclusions of The Lancet–University of Oslo Commission on Global Governance for Health regarding how global political determinants affect health inequities, civil society organisations and academics working on health and Wellbeing of people and planet in the broadest sense could use Raworth's model as an inspiration to launch local and global public debates about how they can be addressed (Ottersen et al. 2014).

As a case in point, very recently, 170 Netherlands-based scholars shared a manifesto in which they plea for a post-COVID-19 development model. This model is based on a policy vision that moves away from development focused on aggregate GDP growth and focuses on redistribution, amongst others, leading to 'more sustainable, equal and diverse societies based on international solidarity, and ones that can better prevent and deal with shocks and pandemics to come' (Manifesto 2020).

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1.3 Prosperity and social inclusion (Eliudi Eliakimu, Linda Mans)

Massive health related inequalities continue to exist and define social segregation. In some cases they are widening, between and within countries. This fact constitutes social segregation, lack of prosperity and in consequence tensions between the people of a region or a country. For example, average life expectancy varies between 50 years in Sierra Leone and 84 years in Japan, children are 14 times more likely to die before the age of five in sub-Saharan Africa than in Western Europe (UNICEF and WHO 2017). Further, in recent years, life expectancy appears to be declining in the US (CDC 2018) and the UK (Office for National Statistics 2017). Environmental, social, and political transformations can affect health directly and indirectly. We focus on critical dynamic trends already affecting the health of specific populations, e.g. global aging, maternal and child health, emerging and re-emerging infectious diseases, the growing prevalence of non-communicable diseases, and urbanization. The COVID-19 pandemic that started in China in December 2019 spread rapidly throughout the world causing widespread "lockdown" and has threatened the Wellbeing of populations and in particular children as a result of social disruptions (Prime et al. 2020). On the other hand, there are reported benefits of the restricted traffic mobility in China in terms of lower mortality rates as a result of the reduction of air pollution (Chen et al. 2020). This further strengthens the fact that it is human activity that is responsible for the pollution of air, water and soil which in turn affects our own health. As an example Ma et al. (2020) reported that air pollution in a heavily polluted city in China was responsible for an increased number of outpatient visits of younger children for respiratory diseases. An analysis of data on COVID-19 and emission of environmental pollutants in Latin America, revealed that "the emission of environmental pollutants such as PM_{10}, NO_2, O_3, and CO from the transportation sector are the main determinants of the COVID-19 pandemic in South American countries, and that higher environmental pollution in South America has contributed significantly to the spread of COVID-19" (Bilal et al. 2021). The growing burden of NCDs requires more attention and efforts at global and country level in understanding and addressing the "commercial determinants of health (CDoH)" in order to be able to nudge populations away from the risks associated with promotion of "products and choices that are detrimental to health". (de Lacy-Vawdon, et al 2020) It also, requires ongoing education to people about physical activities and eating healthy diets.

Several of present trends and health outcomes are linked to global sustainability and could be negatively affected by further climate change (Sellers et al. 2018). Climate change impacts on health—including increased exposures to heat, poor air quality, extreme weather events, altered vector-borne disease transmission, reduced water quality, and decreased food security affect men and women in various ways although also differently, depending on local geographic and socioeconomic factors (Sorensen et al. 2018). If not adequately addressed, these challenges will influence future health trajectories of populations and population groups. A recent study in the US has found that 'air pollution and heat exposure related to climate change may be significantly associated with risk to pregnancy outcomes such as preterm birth, low birth weight and still-birth' (Bekkar et al. 2020). Health is a cross-cutting issue throughout the SDGs, as changes in health impact upon the trajectories of other SDGs (and vice-versa). The status of

population health and health systems in 2050 will depend in the intervening decades on the interactions between the trends discussed. Focusing only on health trends without considering trends in agriculture, demographics, land use, freshwater quality and availability, technology development, and other factors would provide a misleading picture of what is needed in order to improve health throughout coming decades. Technology availability and development in LMICs is a challenge which threatens to worsen already existing health inequalities. Mobile phone ownership by women can have an impact on reproductive, maternal, newborn and child health interventions that are provided by outreach efforts such as family planning and child vaccinations, however, inequality exists in mobile phones ownership for women, especially poor and rural women (LeFevre et al. 2020). Understanding the implications of the interactions and magnitudes of these trends for health requires systems-based projections. Effective, proactive policies and measures, and increased investment in research, development, and implementation could lead to continuing improvements in health. For example, artificial intelligence (AI) has been shown to have a potential for addressing some of the health systems gaps in LMICs, however, its implementation requires taking into account local context and practices in individual countries. Issues like poverty and inequality reduction in some LMICs can better be addressed by having in place advanced social policies (Alami et al. 2020). Therefore, as we embark on the "digital transformation" as noted in Figure 1 of the Introduction to the Learning Module, technology use and a corresponding development of the health sector in LMICs will require further research guided by consideration of the local context in order to be inclusive and sustainable (Alami et al. 2020). For instance, in countries that have been affected by social conflicts and war, use of telemedicine and internet could help in providing services during the time of the COVID-19 pandemic, but knowledge on a professional handling of health technologies is essential for the effective operationalization (Azizy et al. 2020). However, a precondition for prosperity and social inclusion is the end of deprivation, poverty, and violent conflicts. Introduction of new technologies in "food systems" is likely to have both positive and negative effects towards achievement of the SDGs. Therefore, it is of paramount importance to analyze critically new technologies before introduction and implementation and ensure that science is upheld in social movements (Herrero 2021).

Achieving a sustainable economy involves making fundamental reforms to economic and financial systems and tackling poverty and inequality as vital parts of sustainability, according to the report. For example, the United Nations Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES 2019) underlined that 'nature is essential for human existence and good quality of life.' But 'nearly one fifth of the Earth's surface is at risk of plant and animal invasions, impacting native species, ecosystem functions and nature's contributions to people, as well as economies and human health'.

The Group of 20 (G20) Finance Ministers recently endorsed a set of G20/Organization for Economic Cooperation and Development (OECD) corporate governance principles, which 'provide recommendations for national policymakers on shareholder rights, executive remuneration, financial disclosure, the behavior of institutional investors and how stock markets should function' (OECD 2015). The impact of these principles and values on society are not readily apparent, and we might well ask whether principles related to humanitarian

issues, such as the Middle East crises, where, as one example, people of all ages are being displaced at an unprecedented rate, do not merit at least the same, if not more, attention and consideration. Because markets underprovide public goods as producers and consumers rarely have the incentive, governments (and to a lesser extent, civil society) must provide them. The challenge therefore is to re-embed markets and shape them towards the sustainability goals. But governments often also fail to provide public goods. Sometimes they are too poor or not competent to provide them. Sometimes the problem is truly global in nature and must be solved by many or all governments (TWI2050). Market failure and failure of governments to respond swiftly with remedial action, becomes more exposed when there are major global health threats like the COVID-19 pandemic. With the widespread lockdown of societies, a need to reform the food systems has been evident (Nestle 2020). Also, the Ebola and Zika outbreaks, lead to the exposure of failure of both markets and governments in financing "common goods for health", which characteristically require collective financing arrangements from governments or donors (Yazbeck et al. 2019). Therefore, in order to have inclusive and sustainable development, there is a need for collective action in addressing inadequacies of market driven economies (Nestle 2020). The experience so far from the efforts to fight the COVID-19 pandemic is that instead of working as individual country, countries need to cooperate in addressing health emergencies. (Amaya et al. 2021) Also, in the health sector, the Health Policy and Systems Research community need to engage with climate change in particular as we continue fighting with the COVID-19 pandemic and help to frame the agenda after COVID-19 by going beyond the "six health system building blocks". (Marten et al. 2020)

Matthew Parris (Parris 2016), poses the fundamental question 'Is the free market distributing its spoils in a morally defensively way?' He cites the Oxfam study (Oxfam 2015) in 2015 that 'just 62 people owned as much as 3.6 billion people' and that 'The typical FTSE CEO makes 183 times more than their average employee,' while 'The high-end sees chief executives taking home more than 810 times the wages of their average employee'. In terms of allocating salaries, Parris observes, 'Something has gone seriously wrong with the process' that he labels 'a circular hiring squad'. Like others who have tried to find a more equitable approach to reward corporatism, aside from several outlandish or 'crackpot' suggestions, the columnist is stymied and "asking how else we can do it". Such facts indicate that there is failure in the way present day capitalism works, hence, there is a need to rethink capitalism to enable growth that is inclusive and sustainable. (Jacobs et al. 2016)

We may have taken a much too narrow approach to Wellbeing and development, in particular equating growth, material wealth and consumerism with material living standards, argued in 'A vision for human Wellbeing: transition to social sustainability' (Oxfam 2015; Rogers et al. 2012) see 'human Wellbeing' as a multidimensional concept: objective ('material wealth and physical health') and subjective ('such as quality of social relationships or feeling of happiness'). Sustainability 'of the communities most in need', the authors assert, 'will necessitate a more equitable global distribution of resources and empowerment and a move away from 'throw away goods, consumption, and individualism to services, recycling and social relationships, thereby freeing up 'resources, while maintaining (or improving) life satisfaction'. An interim step could be for more corporations to take on board principles, values

and practices espoused in the conscious capitalism (CC) movement (Lueddeke 2014): “Social sciences’ research does make clear the need to replace the consumer culture with something more supportive of human social and emotional needs, diminish inequalities within and between societies, and develop economic and political policies and institutions that serve human Wellbeing in all its dimensions”.

In order to be able to leverage on the foundation set by the SDGs in a way that will transform the societies towards sustainable and inclusive development, Eisenmenger et al. (2020) reminds us that: despite the “strategic potential of SDGs” towards sustainable development, they are “insufficient to lead humanity towards long-term sustainable development”, and hence, “a transformation towards sustainability has to go beyond proposals set with the SDGs; development has to merge an equal distribution of prosperity for all with ecological integrity, without depending predominantly on growth-oriented measurements of progress” (Eisenmenger et al. 2020). Furthermore, there is a need for shifting from the measurement of economic prosperity using the gross domestic product (GDP) to a measure that will measure Wellbeing in line with the SDGs by ensuring protection of ecosystems and promoting equality and equity. (Fioramonti et al. 2019)

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1.4 Peace and non-violence (Rusmir Goletic)

Taking up the relevance of social inclusion treated in the foregoing chapter (1.3 Prosperity and social inclusion) here and in the following case study from war-ridden Bosnia-Herzegovina, a tripartite country in South Eastern Europe, the negative consequences of social unrest, violence and religious and cultural or national separation are focused.

1.4.1 Peace and non-violence, global interdependence and One Health.

We live in an era of stark contrasts. The global economy produces wealth on a previously unimaginable scale. Nevertheless the absolute number of people in poverty continues to rise, and the chasm between rich and poor is widening in many countries (Mazur et al. 1997). With the 'rapid change we are undergoing as a society, if people and companies do not change with our new reality they will be left behind, and it will be a difficult process for them to catch up with the number of iterations of change. As technology-enabled transformation is imperative, new mindsets for humans will be the driver to see a successful implementation to propel businesses forward. Cultural change will become one of the most important drivers of success for companies in the post COVID-19 era. The ground rules, beliefs, and assumptions that drive culture will require rethinking with new mindsets driving employees and business towards success' (Kumar Parakala[4]). Medical science has conquered diseases that plagued humanity for millennia, yet millions die each year because they lack basic sanitation, nutrition, and health care. Our capacity to shape the environment to meet human needs has brought comfort and convenience to many, as well as unforeseen side effects— climate change, species loss, soil erosion, water shortages—that may threaten the planet's ability to sustain life itself.

As we can all witness, the world is both expanding and contracting: expanding with the rapid growth of the human population and economy; contracting as the forces of globalization draw more tightly the bonds that connect us. An increasingly global marketplace is redrawing the map of alliances, forging new ties of economic, political, and social interdependence among people and nations. Promoting a culture of peace and non-violence through education should be a core mission for every scientist/teacher in the World.

As stated in the Preamble of The Earth Charter (Earth Charter Initiative 2001): "*We stand at a critical moment in Earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. Towards this end, it is imperative that we, the peoples of Earth, declare our responsibility to one another, to the*

[4] https://www.ghd.com/en/about-us/ten-emerging-trends-shaping-our-new-future.aspx

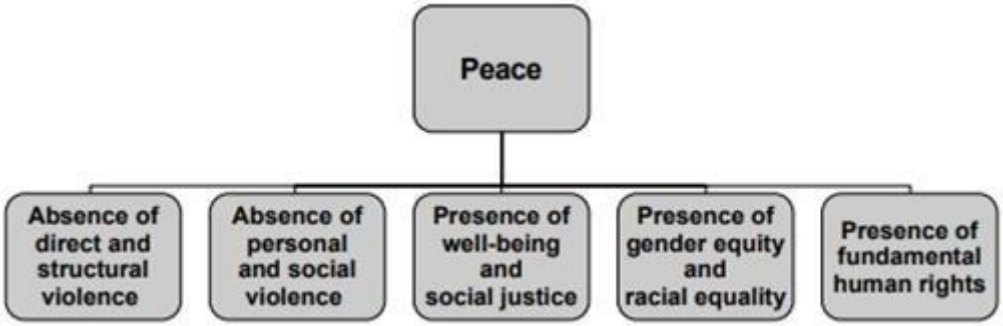
greater community of life, and to future generations"[5]. Therefore, radical changes in the way of life and the values we respect are needed in our lives.

1.4.2 Definitions of peace and violence

Peace should be understood as a positive presence and it entails both public and individual security. It is not only the absence of direct violence such as war, terrorism, assault, murder, ethnic cleansing and rape, but also the absence of indirect violence such as racism, sexism, discrimination and xenophobia. Often there is no way out of such confrontations. 'In terms of the social qualities of peace, it is clear that peace is an objective that people hope to achieve, but it is not the highest one for national security. Therefore, we should not confuse peace with security' (Nakamura 2006; Xuetong 2004).

Peace is a concept of societal harmony in the absence of hostility. Peace is also far from expressions of structural violence such as poverty, hunger and famine, which have been pandemic and endemic in South Asia and Sub-Saharan Africa. The following Figure 1.4/1 illustrates the status and constituent elements of peace (Kramsch 2006).

Figure 1.4/1 Structure of Peace



Source: Language and Culture: The Journal of the Institute for Language and Culture 2006:10, 1-27

As the Figure 1.4/1 shows, peace can be categorized into positive and negative phases. In the negative phase, we can see the absence of direct violence such as wars and terrorism as well as the absence of indirect violence such as poverty and hunger. Another negative phase is the absence of personal, social or institutional violence, that is, assault, rape and bullying. In the positive phase of peace we see Wellbeing, social justice, gender equity and racial equality as well as a guarantee of fundamental human rights. (Nakamura 2006)

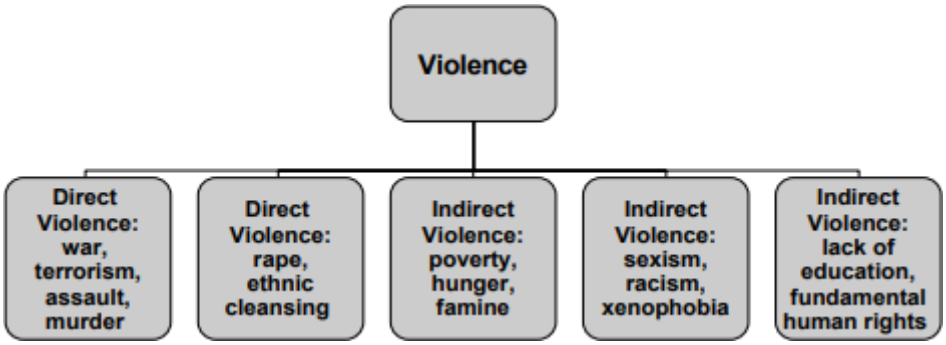
How then could we characterize violence? Can violence be seen as the opposite of peace? In order to better understand the state of peace, we should also better understand the state of

[5] https://earthcharter.org/

violence. Throughout history, we have learned that peace is fragile, and that we must do everything in our power to preserve it.

Human history has also taught us that that people can become obsessed with power, ethnocentrism, land, territory, economy, natural resources, religious confrontation, indoctrination, and xenophobia. The following **Figure 1.4/2** (Kramsch 2006) illustrates the state and constituents of both direct and indirect violence.

Figure 1.4/2. The Direct and Indirect Violence



Source:

Language and Culture: The Journal of the Institute for Language and Culture 2006:10, 1-27

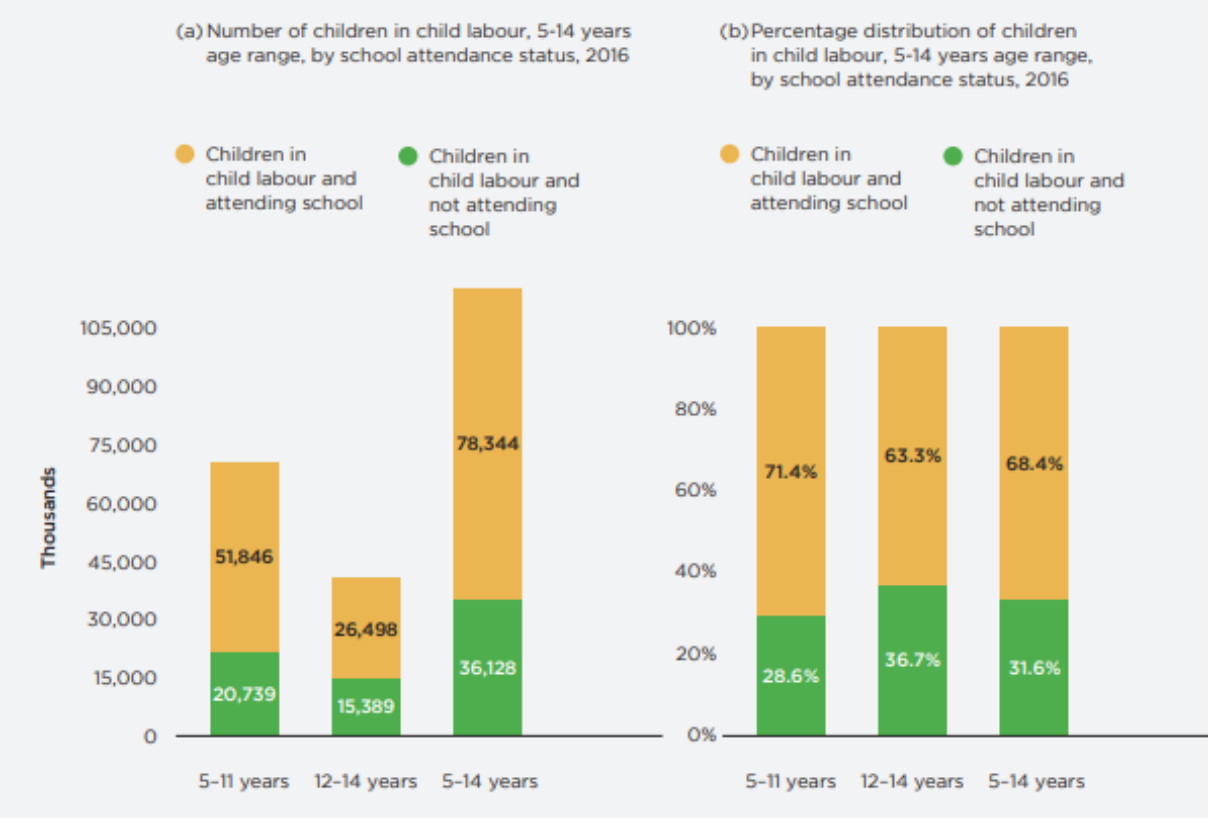
As Figure 1.4/2 shows, violence should be understood both as direct and indirect violence (Nakamura 2006). War and armed conflicts are categorized as direct violence. Poverty and any infringement of human rights are categorized as indirect violence or structural violence. According to the International Labor Office (ILO 2017), a total of 152 million children (64 million girls and 88 million boys) are still engaged in child labor, almost half them in its worst forms that directly endangers their health, safety, and moral development. Children aged 5 to 11 years with 48% form the largest share of those in child labor 28% are aged 12–14 years, and 25% fall into the 15–17 years age range. Younger children aged 5-11 years also constitute a substantial share - about a quarter - of total children in hazardous work, approximately 19 million in absolute terms. The latest global estimates are also the first to address the relationship between schooling and child labor, in turn one of the most important determinants of the impact of child labor on decent work and sustainable livelihood prospects later in the life cycle. The estimates reported in Figure 1.4/3 indicate that a large number of children in child labor are completely deprived of education. All these children are victims of structural violence.

According to WHO (Krug EG et al. 2002), the typology proposed in Figure 1.4/4. divides violence into three categories profiling the perpetrators:

- self-directed violence;
- interpersonal violence;
- collective violence.

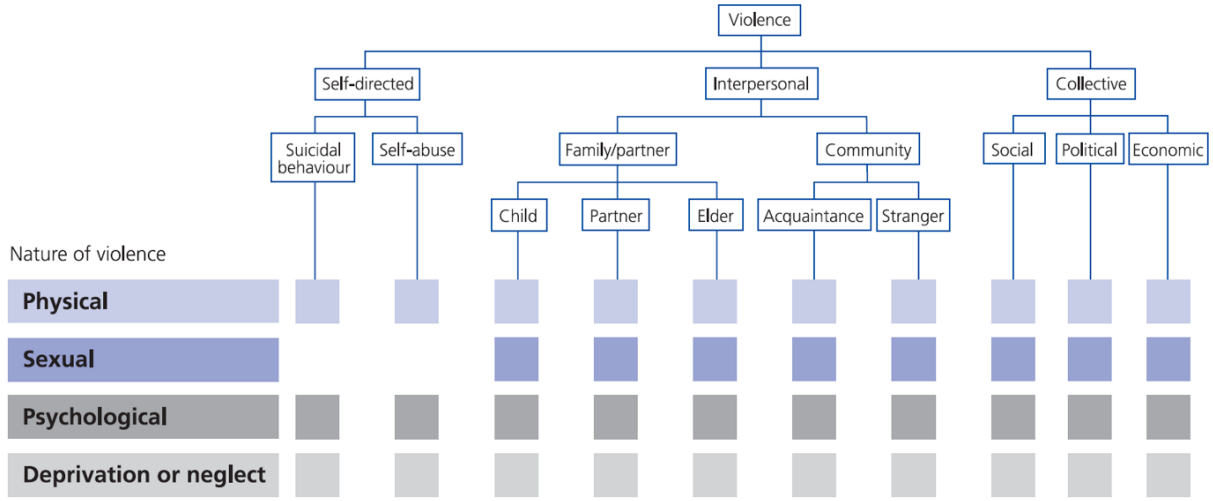
'This initial categorization differentiates between violence a person inflicts upon himself or herself, violence inflicted by another individual or by a small group of individuals, and violence inflicted by larger groups such as states, organized political groups, militia groups and terrorist organizations. These three broad categories are each divided further to reflect more specific types of violence'.

Figure 1.4/3: Child labor and school attendance



Source: Global estimates of child labor: Results and trends 2012-2016, ILO, Geneva 2017

Figure 1.4/4: A detailed typology of different forms of violence



Source: World report on violence and health. Geneva, WHO 2002.

The prevention of violence begins with a description of the magnitude and impact of the problem. Also, we can say that education is the basis for achieving peace on the planet. Therefore, peace education should go hand in hand with global human rights issues and environmental studies. This is an integrated interdisciplinary and multidisciplinary subject and is linked to history, political science, sociology, biology inter alia.

1.4.3 Peace, human rights and Sustainable Development Goals (SDGs) 2030

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDG's), which call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests[6].

The explicit inclusion of 'Peace' in the SDG agenda highlights that peaceful and inclusive societies are fundamental for sustainable development. The absence of violence is a prerequisite for peace[7] (Galtung, 1969); violence and conflict are less likely in societies where institutions are democratic (Hegre 2014). Likewise, political participation and inclusion are vital to social cohesion and for ensuring democratic transformation. Not only does education

[6] https://sdgs.un.org/goals
[7] https://www.un.org/press/en/2018/sc13554.doc.htm

increase political knowledge, it also promotes civic culture and participation in democratic politics as demonstrated in the association between education and democracy (Glaeser et al. 2007; Barro, 1999).

'Transformations to enhance sustainability are often disruptive and could even trigger violent conflict. Acknowledging governance reforms to guide social change as a vital part of transformation is thus crucial'.[8] Throughout history, most great transformations were accompanied by violent conflict, including war (Osterhammel 2009). Although a peaceful transformation to sustainability is the role model for the 2030 Agenda as for TWI2050 we need to consider scenarios with potential outbreaks of conflictive dynamics.

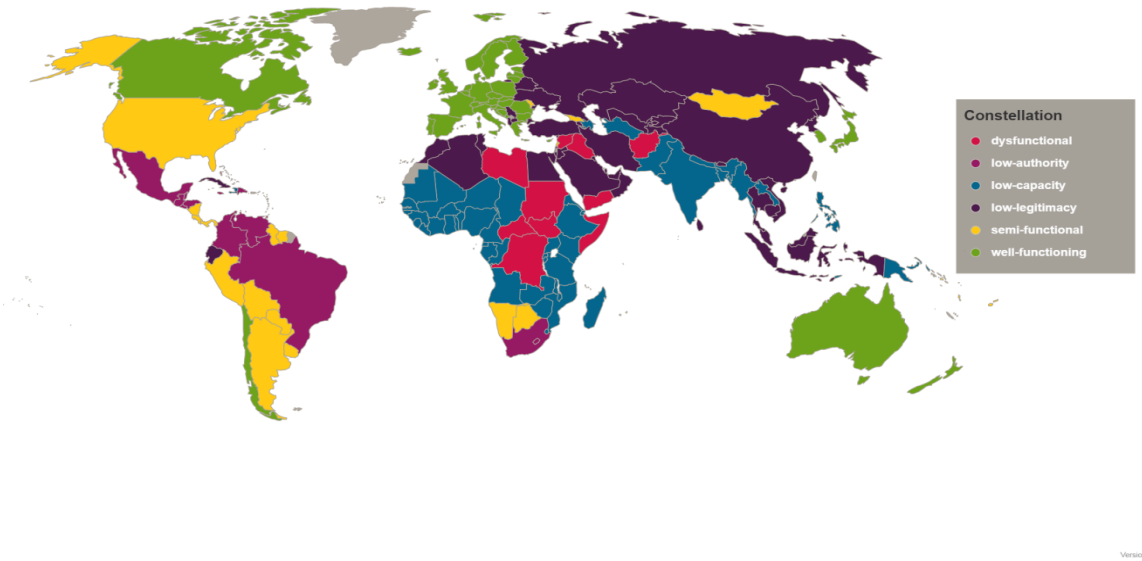
The SDGs integrate these observations, especially in the following SDGs:

SDG target 5.2 calls for eliminating all forms of violence against women and girls, yet there is a long way to go before this target is met.[9] Global estimates for experience of intimate partner violence are troublingly high - over 40% of women age 15 or over in sub-Saharan Africa and South Asia have experienced intimate partner violence or sexual violence from a non-partner at some point during their lifetime (World Health Organization 2013). Even in high-income countries, roughly one in three women have experienced such violence. Children are also disproportionately harmed by violence, the effects of which can stretch well into adulthood due to an increased risk of mental health disorders (Norman et al. 2012).[10]

SDG target 16.1 seeks to reduce all forms of violence, which takes a considerable toll on global public health.[11] Estimates show roughly 150,000 deaths worldwide in 2016 due to acts of war and terrorism, with an additional 390,000 deaths due to interpersonal violence (Naghavi et al. The Lancet 2017). Globally, women and girls are more likely than men and boys to experience intimate partner violence (Desmarais et al. 2012). As said already, frequent occurrence of violence is related to a fragile societal framework determined to a large degree by the executive power a state has (**Figure 1.4.5**).

[8] https://www.die-gdi.de/en/others-publications/article/governing-the-transformations-towards-sustainability/
[9] https://www.un.org/sustainabledevelopment/gender-equality/
[10] https://www.sciencedirect.com/science/article/abs/pii/S1040842816300099
[11] https://www.un.org/sustainabledevelopment/peace-justice/

Figure 1.4/5: Description of constellations of state fragility (Graevingholt et al. 2018, available at: www.statefragility.info.



Legend:

DYSFUNCTIONAL STATES have very low scores on all dimensions of statehood. These states usually have very limited authority over the use of physical violence, have little capacity to provide basic public services and score low on legitimacy.

LOW AUTHORITY STATES have very limited authority over the use of physical violence, but have the capacity to provide some basic public services and have medium scores on legitimacy.

LOW-CAPACITY STATES display little capacity to provide basic public services, but they have decent authority over the use of physical violence and usually have mediocre scores on legitimacy.

LOW-LEGITIMACY STATES have low to mediocre scores of legitimacy, but usually have decent authority over the use of physical violence and the capacity to provide some basic public services.

SEMI-FUNCTIONAL STATES have medium scores on all dimensions of statehood. These states usually have decent authority over the use of physical violence, possess the capacity to provide some basic public services and score better than average on legitimacy.

WELL-FUNCTIONING STATES display very good scores on all dimensions of statehood. These states usually have the authority over the use of physical violence, possess the capacity to comprehensively provide basic public services and score high on legitimacy. They are not considered as fragile.[12]

SDG target 16.2 articulates the need to eliminate all forms of violence against children. Achieving SDGs related to health and violence will require a range of efforts to address violent conflict, as well as the causes of interpersonal violence. Children are also disproportionately harmed by violence, the effects of which can stretch well into adulthood due to an increased risk of mental health disorders (Norman et al. 2012)[13]. Furthermore there is a lack of evidence at the global level on interventions designed to prevent gender-based violence: most of the

[12] https://www.die-gdi.de/statefragility/explainer.html
[13] https://www.sciencedirect.com/science/article/abs/pii/S1040842816300099

outstanding evidence is from high-income countries, despite a greater risk of violence in low- and middle-income countries (Ellsberg et al. 2015).

Programs which support caregivers when children are young can help reduce the risk of violence against children (UNICEF 2014). Recent estimates suggest that among the nearly two billion children age 2-17 around the world, at least half (54%) experienced some form of violence during the past year, rising to over three quarters (76%) when moderate forms of violence such as spanking are included (Hillis et al. 2016). In jurisdictions without specific penalties for domestic violence, creating such penalties can help discourage potential perpetrators and hold abusers accountable for their actions. The data of battle-related deaths described above account only for fatalities from direct violence, the death toll and suffering inflicted through the indirect consequences of armed conflict will be much higher. Considering both the direct and indirect effects of major armed conflicts, battle-related death from wars and violent conflict remain a challenge in affected regions and geographical areas.

Violent, often military conflicts are often rooted in 'economic inequalities, social conflicts, religious sectarianism, territorial disputes, and fighting for control of basic resources such as water or land'.[14] Germà Pelayo, a founding member of the Forum for a New World Governance (Forum for a New World Governance, n.d.), observes that: 'The spread of tensions to many areas of the planet and the difficulties in solving them, as well as the unprecedented ecological deterioration due to the interaction of human activities with the biosphere have reached levels that are threatening the very survival of humankind'. While not wishing to sound apocalyptic, he traces the causes of many of today's unsettling developments to 'an almost permanent demonstration of exclusion and of economic and social inequalities in the low-income districts of towns, both large and small, in every continent'. Equally disturbing are 'the rising power of the networks of organized crime, trafficking drugs and human beings and taking advantage of the absence of strong institutions at every level'. Feelings of alienation are also manifested at national and local levels where 'the disaffected voter is fed up with the status quo and yearns for somebody authentic and uncompromised' and someone who has 'the ability to speak to people in plain language' (Meyer 2015).

Modern accelerated structural changes and modernization processes often are accompanied by a lack of appropriate governance and normative frameworks, needed to shape such ground-breaking innovations. In many European countries and Germany in particular, the radical upheaval in the transition to the 20th century gave rise to political polarization, authoritarian nationalist movements and, ultimately, two devastating world wars. A look at history should provide us with a reminder and a warning in our converging global society at the beginning of the 21st century to fight centrifugal forces within our social contexts and work together to develop solutions to transnational interdependence problems instead of undermining national and international stability and security through nationalism (in more detail: Tozija 2016).

[14] https://www2.world-governance.org/rubrique6.html?lang=en

In many developing countries, emerging economies and OECD nations, nationalist, (in many cases) authoritarian, xenophobic, climate change-skeptical and anti-scientific movements and governments are becoming increasingly prominent. Not least in Europe, as well as at the transatlantic level, they represent a kind of counter-transformation to the sustainability transformation. Multilateral cooperation, climate change mitigation, universal norms and standards, and science are being called into question. While these movements address current challenges in the area of justice and the societal impacts of globalization, they do so in a way that is restricted to a nationalist, backwards-looking agenda (Messner 2017).

There are no simple answers to such regressive trends, but there are four points to note here:

- First, the 2030 Agenda can offer part of the answer to this counter-transformation: More investment in fighting inequality and poverty, job creation and connecting economic and environmental modernization with social inclusion can help to reduce the insecurities and fears about the future that many people experience;
- Second, the confrontation between the concept of sustainability transformations and "Our Country First" movements essentially comes down to a clash between fundamentally differing norm and value systems. The 2030 Agenda and the Paris Agreement are based on universal human rights and principles of global cooperation, transnational justice and responsibility, principles which are being undermined and questioned by nationalist movements and governments. This conflict over defining regarding the future needs has to be resolved;
- Third, we should take account of the fact that the program for sustainability transformation (e.g., scaling up of decarbonisation efforts, acceleration of the transition to sustainability, disruption and systemic change as characteristics of transformative change) can itself give rise to and exacerbate insecurities and fears about the future among people who already feel threatened by the dynamics of globalization and technological change. Social policy and efforts to combat inequality will not suffice in and of themselves to curb nationalist backlashes. Disruptive change on the way to sustainability transformation can only succeed if at the same time confidence in the future grows, social cohesion is fostered, eroding identities are replaced by new local, national and transnational commonalities, cultures, and orientations, and if attractive future prospects arise. Strategies for transformation towards sustainability must take account of these insecurities that many people experience and find appropriate ways of responding to them, for example, through inclusive municipal policies, social, economic and political participation, educational offerings, the creation of development prospects for neglected regions, refugee integration initiatives which also help to improve living conditions for the vulnerable local population, international cooperation, and the promotion of clear standards and values, such as universal human rights, global responsibility and a global culture of cooperation;
- Fourth, experiences in Europe between 1890 and 1910 (Kandel 2012; Blom 2008), the first phase of accelerated globalization, should offer warnings and lessons for the future. In many respects, today's dynamics are similar to those of that period from a

structural point of view: Accelerated international economic activity, exploding trade, and profound structural change as a result of technological advances, profoundly changing labor markets, growing disparities between urban and rural areas, scientific breakthroughs (such as past ones in physics, microbiology, brain research and psychoanalysis and current ones in the areas of digitalization, nanotechnology and neurosciences) – and societies overwhelmed and stressed.

"As Member States recognized at the SDG Summit held September 2020* (UN, SDG's Report 2020), *global efforts to date have been insufficient to deliver the change we need, jeopardizing the Agenda's promise to current and future generations. Now, due to COVID-19, an unprecedented health, economic and social crisis is threatening lives and livelihoods, making the achievement of Goals even more challenging". UN Secretary-General António Guterres.

1.4.4 Peace and education

In a social sense, peace is commonly used to mean a lack of conflict (such as war) and freedom from fear of violence between individuals or groups. Throughout history leaders have used peace making and diplomacy to establish a certain type of behavioural restraint that has resulted in the establishment of regional peace or economic growth through various forms of agreements or peace treaties. Such behavioural restraint has often resulted in the reduction of conflicts, greater economic interactivity, and consequently substantial prosperity.[15]

In the world we live in, teachers and students, today and in the future, must position themselves as peace-loving citizens of the World. Although Nakamura (2006.) addresses students in Japan, we can say with certainty that the same can be applied to all students around the world:"*What students define and understand by concepts such as peace, human rights, citizenship, democracy, social justice, global interdependence and how they relate these to their families and communities will be vital to the future of the World".* Therefore, peace education is a concept based on the theory that education can lead to peace and is the foundation for the emergence of a peaceful nation in the future, and hopefully a peaceful world. It is known that peace education has a positive impact on human behaviour and decision-making, but it is also known that history has not been kind to those who are ignorant of peace (Nakamura 2006; Thompson 2015.).

One of the goals of peace education is to provide all students around the world with the knowledge, skills and attitudes needed to function in their local communities as well as in the global community, living responsibly in a multicultural and interdependent world. Whether local or global, as Palmer (1981) states: Civic culture is a model of how we share a common space, share resources, share opportunities, and manage interdependence in that 'company of strangers' which constitutes the public. In order to avoid all forms of conflicts, we should increase knowledge, develop several skills and transform our attitudes through peace

[15] https://en.wikipedia.org/wiki/Peace

education. The necessary scope of knowledge, skills and attitudes in peace education are interwoven and interrelated with each other. Education is an effective weapon to end wars if it is used as a seed to grow the next generation into mature, peace-loving citizens of local and global communities (Nakamura 2006).

The guidelines and curricula of international education of many democratic countries are based on the philosophy of the UN Charter.[16] It can be safely said that the spirit of this declaration of 1945 lives on. Peace education, or an education that promotes a culture of peace, is essentially transformative. It cultivates the knowledge base, skills, attitudes and values that seek to transform people's mind-sets, attitudes and behaviours that, in the first place have either created or exacerbated violent conflicts. It seeks this transformation by building awareness and understanding, developing concern and finally, challenging personal and social action that will enable people to create conditions and systems that actualize nonviolence, justice environmental care and other peace values.

As the world has continuously witnessed direct and structural violence, the education ministers from each country reconfirmed the necessity of regional and global peace in analogy to the UNESCO resolution in 1994: In the 44th session of the international Conference on Education in Geneva, all the ministers of education adopted a resolution for peace education (UN's Educational, Scientific and Cultural Organization, 1995). In this, they strive for the following[17]:

> 1. to base education on principles and methods that contribute to the development of the personality of pupils, students and adults who are respectful of their fellow human beings and determined to promote peace, human rights and democracy.
> 2. to take suitable steps to establish in educational institutions an atmosphere contributing to the success of education for international understanding, so that they become ideal places for the exercise of tolerance, respect for human rights, the practice of democracy and learning about the diversity and wealth of cultural diversity.

So, new skills are needed to resolve our inevitable differences in a nonviolent way. With universal peace education there is some hope that we may be able to move toward having a critical mass that will demand and address needed changes (Navarro-Castro 2010).

'In the past, however, education has predominantly been viewed as a way to develop human capital to enhance economic growth or to promote national unity. Research on education and peace has been somewhat side-lined in the face of these national priorities. Nevertheless, in this time of globalization that challenges the nation-state paradigm, research on education and peace is more important than ever, and can significantly contribute to the discussion of human security, or protecting human lives and livelihoods. Simply put, as they say at the Central Asia

[16] https://www.un.org/en/universal-declaration-human-rights/
[17] http://www.ibe.unesco.org/en/international-conference-education/44th-session-1994

Institute, education promotes peace. Education has been touted as one of the most powerful tools we can implement in our global efforts to promote world peace'[18]:

1. Education Boosts Confidence & Hope;
2. Education Promotes Independent Thinking;
3. Education Inspires Problem Solving Skills;
4. Education Builds Communication Skills;
5. Education Opens Doors;
6. Education Reduces Poverty;
7. Education Increases Political Involvement;
8. Education Reduces Support of Terrorism & Militancy;
9. Education Builds Empathy & Tolerance;
10. Education Cultivates Respect.

The culture of peace:

Education, and therefore peace education, is the best way to prevent wars, to create new peaceful generations of the local and world community, and to build a culture of peace.

Willis (2002) states that culture is not given but is always being negotiated. So is peace. Peace is not static. Peace is a process of exploring and building Wellbeing of human kinds. Peace culture is not given but should be nurtured and shared with others. The United Nations defined the culture of peace as a set of values, attitudes, modes of behavior and ways of life that reject violence and prevent conflicts by tackling their root causes to solve problems through dialogue and negotiation among individuals, groups and nations (UN Resolutions A/RES/5213: Culture of Peace and A/RES/53/243: Declaration and Program of Action on a Culture of Peace).

Boulding (2000) defines a peace culture as follows: A peace culture is a culture that promotes peaceable diversity. Such a culture includes lifeways, patterns of belief, values, behavior, and accompanying institutional arrangements that promote mutual caring and Wellbeing as well as an equality that includes appreciation of difference, stewardship, and equitable sharing of the earth's resources among its members and with all living beings.

The framework for peace education should offer suggestions for the teaching strategies likely to be successful in promoting cultures of peace. **Figure 1.4/6** (Kramsch 2006) helps to visualize the framework for peace education for peace-loving global citizens based on liberal democracy.

[18] https://centralasiainstitute.org/top-10-ways-education-promotes-peace/

Figure 1.4/6: A framework for peace education for peace loving citizens

Source:
Language and Culture: The Journal of the Institute for Language and Culture 2006:10, 1-27

A liberal democracy is a prerequisite of peace education as liberal democracies do not fight one another, because of shared norms and institutions. A liberal democracy is a starting point for peace education and the best path toward achieving domestic and international peace and security. Owen JM (1994) defines a liberal democracy as a state that instantiates liberal ideas, one where liberalism is the dominant ideology and citizens have leverage over war decisions. It is not too much to say that human history is the history of striving for pursuing liberal democracy through the Magna Carta (1215), the Petition of Rights (1628), the Bill of Rights (1689), the French Revolution (1789-1799), the Civil War in the US (1860-1865), World War I (1914-1918) and World War II (1939-1945) (Nakamura 2006).

Liberal states were remarkably peaceful in, but only in, relations with other liberal states (MacMillan 2004), while many scholars question the attitude of liberal states towards other types of states, i.e. whether they are more peaceful or more prone to war. Yet, at their core, liberal states should be more prone to peace, and there is a presumption that we can prevent wars from starting in a liberal democracy, because liberal democracies are by design more committed to fundamental principles of political participation of all sectors of society and full respect for human rights and the rule of law (Albright et al. 2017). Wars do not start by themselves, but war is the result of human activities, so there must be some way to prevent wars. The prevention of wars lies largely in the hands of the people who govern and manage nation-states or international organizations (Nakamura 2006). There is also evidence that education is a more important underlying driver of democratization than income (Lutz et al. 2010). While political participation is higher among highly educated individuals (Mayer 2011), they are more likely to engage in nonviolent civil actions. Accordingly, it is found that countries with higher levels of primary and secondary school enrolment experience lower risk of

outbreak of civil war and armed conflict[19] (Barakat et al. 2009; Thyne 2006; Collier et al. 2004). By reducing deprivation and vulnerability, education thus is a powerful instrument to reduce grievances (Aoki et al. 2002).

The culture of peace is best described in a statement by The Global Campaign for Peace Education founded at the Hague Appeal for Peace Conference in 1999.: "*A culture of peace will be achieved when citizens of the world understand global problems; have the skills to resolve conflict constructively; know and live by international standards of human rights, gender and racial equality; appreciate cultural diversity; and respect the integrity of the Earth. Such learning cannot be achieved without intentional, sustained and systematic education for peace*."[20]

1.4.5 Globalization and Liberal Democracy

At the dawn of the 21st century, what has been called a cross-cultural century, international education for peace is becoming more urgent as the result of globalization. What is globalization? First of all, globalization is a process of interaction and integration 'among people, companies, and governments of different nations, a process driven by international trade and investment and aided by information technology. This process has effects on the environment, on culture, on political systems, on economic development and prosperity, and on human physical Wellbeing in societies around the world[21]'. During this internationalized process, we can enjoy news, films, food, and culture among different countries all over the world. The process of globalization has promoted mutual understanding regarding other countries and cultures which are developing in different backgrounds. More specific, the process of globalization is nourished by the international trade and progress. The Eastern and Western worlds impact each other on all aspects of human life and the world system[22].

Baylis et al. (2001) state that the word globalization can be distinguished with five general usages:

1. Internationalization - intensification of cross-border interactions and interdependence between countries;
2. Liberalization - a process of removing government-imposed restrictions on movements between countries in order to create an open integrated world economy;
3. Universalization - the spread of various objects and experiences to people at all corners of the earth, Westernization, especially in an Americanized form;
4. Deterritorialization - a shift in geography whereby territorial places, territorial distances and territorial borders lose some of their previously overriding influence. Globalization in this context refers to the process of increasing interconnectedness

[19] https://iiasa.ac.at/web/home/resources/publications/IIASAPolicyBriefs/pb19-web.pdf
[20] https://www.peace-ed-campaign.org/about/
[21] http://www.globalization101.org/
[22] https://www.ukessays.com/essays/politics/how-globalisation-has-impacted-on-liberal-democracies-politics-essay.php

between societies such that events in one part of the world have effects on peoples and societies far away;
5. Economic interdependence – e.g listening to the South is a prerequisite of international and development-oriented education.

In the last decades we witness a dramatic increase in multicultural, bicultural, transcultural and transnational personalities, who have several layers of personal, ethnic, national and global identification as well as transnational and transcultural organizations and institutions. These people often are more sensitive to local and global peace as they are living in multicultural contexts and corresponding identities. Our multicultural orientation depends on whether we view these transcultural and transnational people as a social minority for the present or as a future human resource for regional, national and global cultural progress. Globalization, therefore, is a very vital issue for educators and student teachers to create local cultures of peace in a multicultural context.

The challenge we face today is to ensure that globalization becomes a positive force for liberal democracy followed by cosmopolitan democracy. It is true that it takes more time, energy, communication, respect, reconciliation and sense of human solidarity to build cosmopolitan democracy. However, it can bring about a shared culture of peace and welfare for the world's population, especially for innocent children and the poorest of the poor, instead of leaving billions of them behind in squalor.

1.4.6 Conflict in the New Age

Research on peace and education must be situated in each particular circumstance. In today's modern age, we are witnessing conflicts that are characterized as interstate, but we are also increasingly witnessing conflicts that take place between different national, religious or other groups within the borders of one state. It is extremely difficult to compare the horrors of war conflicts, whether they are interstate or intrastate, but sometimes it is more difficult to understand the full extent of intrastate conflicts when former friends, neighbors or members of the same family can be found on different sides.

One study shows that over 20 million died as a result of the wars between 1945 and 1993, of which 70% were casualties in interethnic clashes (Welsh D, 1993.). Today, it is commonly understood that interethnic conflicts are not necessarily attributed to the thesis of Clash of civilizations, 'but may be multifaceted, such as including competition for resources. Still, given that the majority of today's sovereign states are multicultural, and previously homogeneous states are getting increasingly multicultural due to the globalization, one has to underscore the importance of addressing the challenge of 'Living together' (Komatsu T 2017).

In post-conflict societies, extreme forms of multiculturalism have rather been seen as a threat to peace-building than as an approval of cultural rights. A typical example is post-conflict Bosnia and Herzegovina (hereafter referred to as BiH) which witnessed violent clashes during the war (1992–1995) between three constituent people distinguished by their religions.

Bosnians (Muslims), Serbs (Christian Orthodox), and Croats (Christian Catholics), each claimed their right to educate their children according to their ethos. Such claims of cultural rights can manifest in a 'Group of national subjects', defined by a common history, religion, or language. Prior to the interethnic conflict, children from these different ethnic backgrounds went to the same schools together, learned together, and played together. Now, many of these schools have become mono-ethnic, or become 'Mixed schools' by adopting so called 'Two Schools under one Roof' arrangements, where children of two ethnic groups share a school building but learn in completely separate environments with different curricula and school leadership.

'Alarmed by the polarization of BiH society, the international community has been prodding the ethnic leaders to work together on the provision of educational services to promote national integrity. In 2003, the international community demanded that the authorities adopt the Common Framework Law to ensure that children learn a common set of knowledge, skills, and values based on democratic principles. In addition, a new education agency was established at the central level to coordinate and harmonize the nation's education delivery, previously fragmented by 13 ministries of education. The Council of Europe has demanded that the national authorities adhere to the Common Framework Law and made it clear that BiH could only become a member of the European Union as a unified nation. However, any move toward a more unified nation has been met with strong resistance. The creation of ethnically mixed schools is seen as an attempt to assimilate one group onto the other. Subjects such as history and geography are particularly contentious and may be irreconcilable', because each group stresses its own version of events (Kreso 2008.).

On the other hand, the health impact of military and civil conflict, cleansing and genocide, short as well as long term, is still a neglected topic and public health training and education is lacking. It concerns not only death and permanent physical and/or psychological mutilation but also an enormous waste of economic resources not available for health development. Schools of Public Health describe in a recent Europe-wide survey (Bjegovic-Mikanovic et al. 2013) their output in the area of preparedness for health emergencies as the least successful. Increasingly it is recognized that violent conflict not only has a short term impact on health and particularly mental health of the persons and population groups afflicted but long term consequences as well. People working in the health sector are confronted with the acute events but with survivors, bystanders or perpetrators as well, on a daily basis in many countries, worldwide. Especially challenging is the situation in Southeastern Europe where the population has been hit severely by violent conflicts in the nineties (e.g. in Bosnia & Herzegovina, Croatia, Macedonia, Serbia & Kosovo). Germany, Poland or Russia are examples of countries with comparable experience more than half a century ago.

Public health professionals should be trained to respond better to health and psychosocial needs of individuals and populations affected by military and civil conflict, cleansing and genocide. This concerns predominantly public health professionals who are usually in a managerial function for programs of health promotion and protection, and complex humanitarian emergencies. Requirements are: 1) to determine training needs for public health professionals

in the area of complex humanitarian emergencies and their long term impact; 2) to disseminate current knowledge and expertise on the health impact of violent conflicts; 3) to provide tools for screening and evaluation, and 4) to propagate awareness and understanding of the general public. Finally such training modules should be developed preferably in the framework of master of public health and/or continued professional development programs at the European Schools of Public Health.

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1.5 Case study on ‘Jajce - Two Schools under one Roof’ (Rusmir Goletic)

In the 21st century, when modern technologies are becoming available to more and more people around the world, when children start using modern technologies at an ever younger age, a phenomenon called ‘Two schools under one roof’ is still happening in the Federation of Bosnia and Herzegovina (BiH).

Why did this phenomenon occur? It is a consequence of war and ethnic cleansing, artificially created areas in which some people represent a relative majority. The two-schools-under-one-roof-arrangement was established as a temporary measure to address the ethno-centric educational system and encourage the return of displaced persons and refugees.

Why is this phenomenon still present 25 years after the civil war? The answer to this question requires more detailed research, but in principle it can be said that the responsible persons (especially politicians) cannot or do not want to solve this problem. Originally a temporary measure, this arrangement has become permanent despite the efforts of the international community to ensure its transition.

What is the impact of this arrangement on the psycho-social condition of pupils and how will it affect the formation of their personality? This issue requires serious consideration and research, given that this phenomenon has existed for more than 20 years and there are still no indications for solving this problem.

Does this phenomenon lead to a long-term stratification between different ethnic groups and can it be the cause or one of the causes of new conflicts in BiH in the future? This burning problem would have to be addressed by scientists in BiH, but also by the international community, which is still the guarantor of peace in BiH.

Does the education system in BiH need change? There is no doubt that it needs comprehensive change, but how and in which way are issues that require in-depth analysis.

1.5.1 The present situation

After the war in the 1990s, segregation in education based on language, nationality, religion and/or ethnicity began to appear more and more frequently in Bosnia and Herzegovina (BiH) which prevents children from receiving a quality education (Kadrić 2018).

One of the projects of segregation policies of ethno-nationalism (and probably the most perfidious) is the establishment of a model of divided education, better known as 'Two schools under one roof'. It created the conditions for systematic alienation from the other and channeled and structured teaching of nationalism. The end result of such an arrangement is possibly the upbringing of nationalists (Numanovic 2012).

According to available data, there are as many as 56 segregated schools in BiH (**Figure 1.5.1**). This phenomenon is present mainly at the territories which are inhabited by majorities of Bosniaks and Croats. Furthermore one has to know that the dialects of Croat catholics, Bosniak muslims, and orthodox Serbs are very similar and originate from the same Slavic language. The cantons and municipalities with segregated schools are:

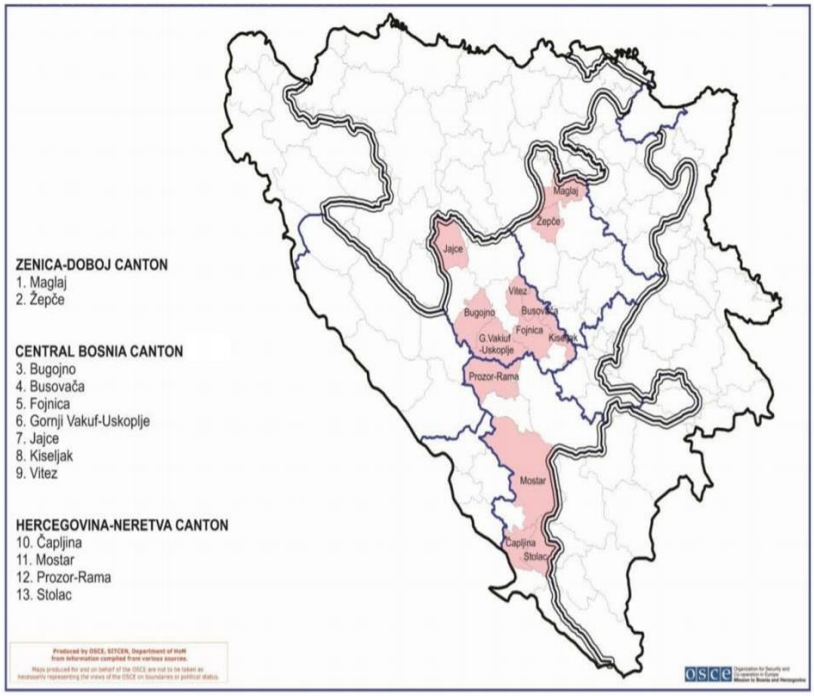
- Zenica-Doboj Canton (municipalities: Maglaj, Žepče)
- Central Bosnia Canton (municipalities: Bugojno, Busovača, Fojnica, Gornji Vakuf-Uskoplje, Jajce, Kiseljak, Vitez)
- Herzegovina-Neretva Canton (municipalities: Čapljina, Mostar, Prozor-Rama, Stolac).[23]

Therefore, children from two ethnic groups, Bosniaks and Croats, attend classes in the same building, but physicallyseparated from each other and also taught separate curricula. Children from one ethnic group enter the school through one door, while children from the other ethnic group through another door. Bosniaks work according to the federal curriculum, and Croats rely on the curriculum of neighboring Croatia. The most striking examples of two schools under one roof are found in the Neretva Canton of Central BiH. This model is a direct consequence of the Bosniak-Croat conflict (1992-1994) and the creation of the self-proclaimed Croat para-state of Herceg-Bosna on the territory of Bosnia and Herzegovina. Due to obstructions to implement the decision on the unification of education, the Office of the High Representative (OHR) fired the Minister of Education of the Central Bosnia Canton in 2005, but the problem has not been resolved even today.[24/25]

The educational system in other areas of Bosnia and Herzegovina, where there are no so-called 'Two schools under one roof' is not much better, given that the needs of students of other minority nationalities in the area are generally not taken into account. The fact is that a large number of children are still being denied the right to use their own mother tongue, what certainly should not happen in the 21st century. The negative effects of disunited education are mostly to be reflected regarding the pupils - their quality of education and their psycho-social development (Numanović 2012).

[23] https://www.osce.org/files/f/documents/3/8/404990.pdf
[24] https://en.wikipedia.org/wiki/Two_schools_under_one_roof
[25] https://bs.wikipedia.org/wiki/Dvije_%C5%A1kole_pod_jednim_krovom

Figure 1.5/1 'Two Schools under one Roof' – Locations



Source: 'Two Schools Under One Roof' The Most Visible Example of Discrimination in Education in Bosnia and Herzegovina, OSCE, Mission to Bosnia and Herzegovina 2018.

Resistance to this phenomenon exists among students and parents, who do not want the separation of children, especially not in the way it is happening today. An example of this is the revolt of students at the 'Secondary Vocational School' in Jajce, when the system tried to introduce segregation by creating a new national school at the same location. Together, Croatian and Bosniak children rebelled against these plans, and their rebellion was strongly supported throughout the country, as well as by the international community.[26/27/28]

1.5.2 Possible alternative solutions

How can the problem be solved? It can be solved by relying on the fact that every child has the right to speak their own mother tongue as all three main dialects are similar originating from the same Slavic language. Likewise teachers with different dialects need to be employed.

[26] http://balkans.aljazeera.net/vijesti/ucenici-iz-jajca-ostaju-zajedno-nece-biti-nove-skole
[27] https://www.balcanicaucaso.org/bhs/zone/Bosna-i-Hercegovina/Slucaj-dvije-skole-pod-jednim-krovom-u-Jajcu-180584
[28] https://www.dw.com/hr/u%C4%8Denici-u-jajcu-ne-pristaju-na-podjelu/a-46852015

Unresolved issues in subjects such as history, geography etc. can be left for another period of time, focusing for now on those topics of mutual interest.

At the highest international level, at the UN Committee meeting in 2008[29], a request was made to Bosnia and Herzegovina to abolish the concept of two schools under one roof. The respective Recommendation no. 50 reads: The Committee urges the State party to ensure that the practice of 'Two schools under one roof' is stopped and that separate schools for children of different ethnic groups are built. The Committee recommends that the State party integrate and teach one curriculum to all classes, regardless of ethnic origin, and asks it to report on all steps in this regard in its next report. Unfortunately the State of BiH obviously is not capable to solve this problem (Brkić et al. 2009), - even twelve years later in 2020.

The practice of 'Two schools under one roof' is not only contrary to the principles of the BiH Education Reform Strategy, but also to the international obligations assumed by BiH and domestic legislation in the field of education.

The international community, led by the OSCE (Organization for Security and Co-operation in Europe), has worked hard on the administrative unification of divided schools, and there are some first steps towards overcoming segregation. Gymnasium Mostar united in 2004 and Secondary Mixed School in Žepče united in 2005, these two often are mentioned as shining examples. Administrative-legal unification of divided schools in practice means that out of the existing two legal entities one is formed in the same building. Such schools have a joint school board, joint principal and deputy principals, who are from different constituent groups, joint governing bodies of the school, and joined student and parent councils. However, according to this model, over ten years after the unification of schools, male and female students attend all their program in different classes according to whether they follow the Bosnian or the Croatian curriculum. It is obvious that classes in two curricula cannot be organized for children in the same class. Thus, only the administrative integration of the school was realized in a barely moderate way to ensure the transition from segregation to inclusion. Needless to say, this did not solve the problem of inequality of children of parents from the Serbian community, here in a minority position and others (e.g. Roma). In general, discrimination of those parents/guardians and children continues who want education based on intercultural principles and learning about cultural and other specifics in BiH and, what not, the region.[30]

The Progress Reports of the Commission for the years 2011[31] and 2012[32] underlined that the separation of children within the school facilities along ethnic lines and the existence of Two Schools under one Roof realities ‘constitute a *de facto* ethnic-based separation and that discrimination in public schools remain a serious issue of concern. From the perspective of the

[29] Bosnia and Herzegovina became a Member State of the United Nations on May 22, 1992 (Resolution 757).
[30] https://www.diskriminacija.ba/teme/dvije-%C5%A1kole-pod-jednim-krovom-simptom-ali-ne-i-uzro%C4%8Dnik-bolesti-bh-obrazovanja
[31] https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/pdf/key_documents/2011/package/ba_rapport_2011_en.pdf
[32] https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/pdf/key_documents/2012/package/ba_rapport_2012_en.pdf

respect of human rights, these circumstances continue to hamper access to quality education and do not foster the development of an inclusive, multi-cultural, and tolerant society. Moreover, in general, reforms are slow to take place, as politicians and school administrators from different ethnicities struggle themselves to attain compromises' (Tolomelli 2015).

Therefore, the alternative to Two Schools under one Roof is an inclusive school 'where children attend many classes together and, while linguistic and cultural differences are maintained', including separate classes for language and religion, Children should 'learn from curricula which promote tolerance and critical thinking and expose students to multiple perspectives'. To advance decisively toward such inclusive schools, the following steps are recommended:

1. Political dialogue
2. Administrative and legal unification of schools
3. Increasing interaction among children
4. Curricular reform
5. Respect for court decisions
6. Donor responsibility.[33]

However, there are still those who advocate the preservation of separate schools (under one roof), because the abolition of such schools would be at a loss to members of one, a second or third ethnic group, defending it with the thesis: Two Schools under one Roof are not segregation, but the constitutionally and legally defined right of three people to be educated in their own language.[34]

1.5.3 Selection of an alternative solution

Researchers and parents need to decide which of the offered alternatives is acceptable to them and they should build further steps on that.

a) Is it necessary to keep the phenomenon of 'Two schools under one roof' as a permanent solution, by separating children according to ethnicity?

b) Is it an acceptable solution to abolish 'Two schools under one roof' and introduce separate schools for students of different ethnic groups, and should such a solution become permanent?

c) Is it necessary to abolish 'Two schools under one roof', and build an education system that allows each student to use their mother tongue, and develop teaching

[33] https://www.osce.org/files/f/documents/3/8/404990.pdf
[34] https://www.diskriminacija.ba/teme/travni%C4%8Dki-protest-zajedni%C4%8Dko-obrazovanje-protiv-odvojene-indoktrinacije

materials based on compromises by all sides, so that all ethnic groups are at least partially satisfied?

The prevailing conclusion is that preference should be given to the abolition of 'Two schools under one roof'. In this way, respect for the principles and legal obligations arising from the 2014 judgment of the Constitutional Court of the Federation of BiH can help establish an inclusive and non-discriminatory teaching process[35]. The practice of two schools under one Roof' is a clear case of discrimination and breaches international human rights conventions that BiH has ratified.

The Universal Declaration of Human Rights (UDHR) declares: *Everyone has the right to education*. In addition, it states that: „*Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace*"[36].

In this heated debate, is it possible 'to look forward and hope that education might overcome ethnic boundaries and promote peace for the future of Bosnia & Herzegovina? The Dayton Agreement simply maintains the situation as it is, avoiding the possibility of a stronger and lasting reconciliation. While many politicians focus only on their self-serving campaigns based on nationalistic ideologies, and young adults have more possibilities nowadays to leave their country and live abroad, children and poorest families are forced to live' under a cover of invisible, everlasting conflict. In the meanwhile, international organizations and NGOs make slow progress in the educational sector, as the political divisions and inefficiencies in the country make reform an upward battle (Tolomelli A. 2015).

Perhaps it will become an option to introduce inclusive schools as an alternative solution to the current model of 'Two schools under one roof', but such a solution should be temporary, and work must be done to build a unified education system modeled according to developed countries such as Switzerland or Belgium.

The current situation can therefore be overcome in accordance with the recommendations of the OSCE Mission to BiH (2018) (wording adapted):

> 1. Political dialogue – It is recommended that political leaders engage in intensive dialogue towards resolution, using this report as a basis for their discussions. Ideally, this would include a public pledge of commitment to end the damaging practice of 'Two schools under one roof'. Outputs that would aid them in implementing this pledge would be the development of an Action Plan with clear milestones. The participation of a broad spectrum of stakeholders would be beneficial to the process and its outcomes.

[35] http://vasaprava.org/?p=2092
[36] https://www.ohchr.org/EN/UDHR/Documents/UDHR_Translations/eng.pdf

2. Administrative and legal unification - Administrative and legal unification of schools is a feasible and pragmatic step towards ending segregation. Unified schools protect expectations of national distinction while breaking down discriminatory barriers. Through this change, children would have many more opportunities to interact, thus challenging the 'them versus us' narrative. In addition, unified schools would also mean a more effective use of human and financial resources, allowing for savings to be redirected towards improving the quality of teaching, materials and facilities.

3. Increasing interaction among children: Alongside the administrative and legal unification of schools, it is also recommended to maximize the amount of interaction between children, through:

- giving visible and concrete support for joint extracurricular activities by issuing an official instruction on the mandatory allocation of time within annual school plans, providing sufficient resources, monitoring of schools' progress and promoting positive examples;
- encouraging, approving, facilitating and promoting the introduction of joint classes;
- implementing non-sensitive activities, such as sports competitions, arts, drama clubs, field trips, after school activities;
- developing specific activities to nourish an environment where all students have an opportunity to learn, understand and respect different cultural and religious backgrounds;
- identification of suitable subjects and projects (foreign languages, arts, IT, math, etc.) together with teachers, students and parent council;
- adaptation of curricula and teaching materials;
- coordinated timetabling and lesson planning; and
- professional development for teachers on the implementation of joint classes and projects.

4. Curricular reform - Comprehensive implementation of the enhanced BiH Common Core Curriculum based on Student Learning Outcomes (CCC SLOs)[37] followed by the development of new textbooks and enhancement of teacher pre- and in-service education. These reforms would be major steps towards improving the education system in BiH. CCC SLOs shift the education paradigm from the rote memorization of facts to the development of 21st century competencies. Implementation of CCC SLOs will ensure:

[37] The BiH Common Core Curriculum was agreed upon and developed in 2003 with the aim to foster the feeling of belonging to BiH, good quality education, curricula harmonization and student mobility within BiH. It contains a list of common teaching topics and has been embedded in all curricula in use in BiH. The BiH Agency for Pre-Primary, Primary and Secondary Education, with support of the Mission and other international partners, enhanced the initial Common Core Curriculum by introducing the concept of student learning outcomes.

- Common learning outcomes
- Mobility of students across the country
- Common student achievement standards
- Development of functional as opposed to theoretical knowledge;
- Competence – based learning and teaching, fostering critical thinking and multiple perspectives.

5) Addressing language concerns - Linguistic differences should not be overemphasized to segregate students based on ethnonational affiliation. It is entirely feasible for teaching to take place in one language, while fully respecting the others. In such a situation students would be guaranteed their right to study their mother tongue. Classes could also extend to encompass broader issues of culture and national identity.

6. Respect for court decisions - The non-implementation of binding court decisions is a significant challenge across BiH, but there are a number of possible ways forward in relation to 'Two schools under one roof':

- interested and engaged actors across BiH should advocate for and support the implementation of relevant court decisions, possibly including through seeking remedies before the European Court of Human Rights;
- courts should give due consideration to recommendations of the Ombudsman Institution;
- the EU should continue to emphasize the non-implementation of court decisions when assessing adherence to the rule of law in relation to BiH's EU integration process;
- generally, courts should ensure that specific officeholders are responsible for implementation of their decisions in accordance with a specific timeline; courts should also alert relevant prosecutor's offices of non-implementation, for which the latter should seek criminal sanctions in instances of non-compliance.

7. Donor responsibility - Potential donors should avoid directing their funds and assistance to projects which would only benefit one ethnic group or support further division of students (i.e. building new mono-ethnic schools). Instead, it is recommended that donors actively support those schools and institutions which implement the recommendations of this report in good faith.

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1.6 COVID-19 in the Gaza Strip and the West Bank under the political conflict in Palestine (Yehia Abed)

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Abstract

COVID-19 is a serious pandemic with variation of spread, morbidity, and fatalities between countries. Palestinians are facing the epidemic while they are the only occupied country in the world, with around 2 million inhabitants under siege in the in the highly populated Gaza Strip for the last 14 years. The occupation and siege are the main threat factors for the spread of disease among the Palestinian population. The Palestinians faced the Corona epidemic with limited facilities in their hand. However, the risk factors remain multiple, the most important are overcrowding in the Gaza Strip, poor health care facilities, and the risk of workers moving between the West Bank and Israel. Palestinian Health authorities responded directly to the pandemic and took strict closure measures to prevent rapid spread. The Palestinian strategy has focused on social spacing, personal hygiene, control of border crossings and health preparedness to deal with medical cases while continuing to provide health services to the population. The difficult economic situation is the major obstacle facing Palestinians to overcome the disease spread where workers continue their jobs inside Israel and Gaza cannot enforce low-income workers to stay at home. More is needed to ensure community engagement, support coordination among all health care providers in Palestine, and take effective steps to promote social spacing. Friendly countries and international organizations can assist and support the Palestinian population in providing laboratory diagnostic materials, providing personal protective devices, strengthening intensive care units, and supporting outreach activities and training programs.

Keywords: Palestine, Gaza Strip, COVID-19, control measures

Introduction

Palestine is located on the eastern coast of the Mediterranean Sea. Its remaining area is divided into two geographically distinct regional units, the West Bank and The Gaza Strip. According to the Palestinian Central Bureau of Statistics the total population in 2017 was about five million, thereof two million throughout the last 14 years locked in the Gaza Strip (GS) - with its 365 square kilometers one of the most densely populated areas in the world (5,324 people per square kilometer (1)). In one of the UNRWA refugee camps population density reaches even 80,000 per square kilometer (2). The unemployment rate in the Gaza Strip is around 52% (3) whereas 53% of the population are suffering from poverty (1), and 69% are exposed to food insecurity (4).

Historically the first known epidemic reported in Palestine was “Amwas plague, 639 A.D." so-called by the name of a small Palestinian village between Jerusalem and Ramallah. This plague spread throughout Great Syria leading to the death of estimated 25, 000 people (5). In 1799 the plague of Acre city erupted between the French soldiers led by Napoleon Bonaparte after a two-month siege of the city. This plague led to the death of about 2000 French soldiers (6). In the last 50 years, Gaza was exposed to more than 20 epidemics including poliomyelitis1974 and 1976, Cholera 1981 and 1995, Measles between 1971 and 1991, Meningitis 1997, Avian Flu 2006, and Swine Flu 2009.

This paper aims to study the extent and determinants of the COVID-19 epidemic in the Palestinian territories, to identify the readiness of the Palestinian health sector to face the COVID-19 epidemic, and to develop recommendations that may help decision-makers to reduce the spread of the epidemic.

The Palestinian health system and its challenges

The Palestinian National Authority assumed responsibility for health services in the West Bank and Gaza Strip - which Israel occupied in 1967 - following the Oslo Peace Agreement between the Palestine Liberation Organization (PLO) and the Government of Israel in September 1994. The Palestinian National Authority (PNA) was established in May 1994, and the Ministry of Health shortly thereafter. The health care system consists of four service providers: The Ministry of Health, the United Nations Relief and Works Agency (UNRWA), Non-Governmental Organizations (NGOs), and the private sector. Questions have been raised about the PNA's limited ability to prioritize health services and interventions. Political insecurity and socio-economic instability have affected the health of the population and the ability of Palestinians to develop a modern health system, particularly intensive care rooms, respirators, and lack of access to serve residents in the neighborhoods of Jerusalem and the occupied areas "C" in the West Bank (WB). Despite increased health spending, the impact of the political split has been severe and harms the population of the Gaza Strip. There is a chronic shortage of basic medicines and health supplies for more than one-third of what is needed, especially with regard to emergency rooms, operations, intensive care, orthopedic services, nephrology, and neonatal care. The Palestinian people have faced many restrictions that have affected their ambition to create a functional Palestinian health system that responds to the needs of the population, most important the containment for the last fourteen years.

First the blockade imposed on two million Palestinians in the Gaza Strip deprives them of the development of their scientific capabilities, prevents the entry of equipment, medicines and diagnostic materials and prevents patients from receiving their health services even within the Palestinian territories, which have been torn apart by the division.

Second the detention of Palestinian tax funds, which have severely disrupted the life of Palestinian society, thereby preventing Palestinians from using their resources to operate the health system. Seizing tax revenues by the Israeli government lead to major obstacles in the

daily work of the Palestinian health care centers, including reduction of the salaries of health workers who in spite of that continued to work with minimum salaries.

Third the U.S. assistance to the Palestinian Authority, including Jerusalem hospitals and health projects in the Gaza Strip, has stopped by a political decision to put pressure on the Palestinians. For example the author and his team spent more than one year preparing plans and responding to USAID requirements but finally the project was cancelled without implementing the planned field activities and abandoning multiple health activities that were prepared over a long period and after a lot of effort to respond to multiple requirements developed by USAID.

Fourth the cut of financial aid to UNRWA and pressure on other countries to cut off their support either. It is worth stating that the establishment of UNRWA was based on the international Resolution on Action and Relief for the Palestinian population. This decision affects the most the population of the Gaza Strip, where 70% of the population are refugees receiving their primary health care services through UNRWA.

Fifth three devastating Israeli military attacks on Gaza in 2008 2012 and 2014 destroyed buildings, schools, and health centers, requiring permanent efforts to restore buildings and functionality.

The health and humanitarian needs and challenges facing the people of Gaza remain tied to the continuing siege, lack of supplies and equipment, drugs, and human resources, as well as limited availability of electrical power. The increasing impact of NCDs on the healthcare system; and the growing number of denials and delays related to requests for medical services abroad have resulted in increased morbidity and mortality. On average, the Ministry of Health (MoH) in Gaza is facing shortages accumulating e.g. to one-third of essential drugs and medical disposables. These restrictions have damaged the Palestinian health system and deprived it of development and even the provision of basic health services to the population. The current COVID-19 epidemic is increasing the burden on the system.

The COVID-19 pandemic

During the past two decades, the world has been stricken by two pathogenic respiratory Corona virus pandemics; the Severe Acute Respiratory Syndrome (SARS) (7) and the Middle East Respiratory Syndrome (MERS) (8). In December 2019, a third respiratory coronavirus has emerged starting from a large metropolitan area in China's Hubei province, Wuhan. Most of the cases present with fever, dry cough, and tiredness, although clinical presentation ranges from asymptomatic to atypical severe pneumonia (9). By 11 March 2020, the WHO declared COVID-19 a pandemic (10). Neither medication nor a vaccine has been approved for example by the American Food and Drug Administration (FDA). Preventive measures are the only solution to save lives and to provide the countries with more time to prepare for the arrival of the virus (11). Within a short time, the disease spread to include most of the world countries. All countries in the Arab region have reported COVID-19 cases, Yemen was the last. Most

Arab countries also have available a national rapid response for timely investigation and response to public health threats (12).

Similar to other countries, Palestinians started preparations to face the coming virus with their scarce resources by forming scientific committees to review the available emergency plans and protocols supported by the World Health Organization and train the local staff for relevant subjects including infection prevention, proper use of personal protective devices, and case management including intensive care for seriously ill patients.

The preparedness activities were followed by the response when the first case was reported in Bethlehem city in the West Bank (WB). The effort focused on the complete isolation of the city and closure of markets, schools, universities, mosques, and churches, as well as a ban of major social gatherings. In Gaza, the first two cases appeared three weeks later than in the West Bank which allowed time to prepare the same regulations. By May 20 (last modified date), 602 cases had been registered, of which 547 were in the West Bank, including East Jerusalem, and 55 in the Gaza Strip. It became clear that the limited prevalence of cases in the West Bank was concentrated in the middle of the country, i.e. in the governorates of Jerusalem and Bethlehem with a northern expansion to include parts of Ramallah and a south expansion to include parts of the Hebron Governorate. The integrity of the northern West Bank was preserved, as no cases are reported in some Governorates there. Seventy-five percent of all cases can be attributed to a single source, the workers moving across the Green Line and their contacts, while in the Gaza Strip, the registration of cases is still limited to the quarantine centers and no positive endogenous cases have been reported so far. Eighty percent of cases occurred among young people under 50 years of age and two-thirds of cases were identified among males, with a higher prevalence among workers. Like for other countries, the risk groups are aged people with chronic disease and workers moving to and from inside Israel where the latter constitute a major risk of disease transmission to WB. Thousands of Palestinian prisoners in Israeli jails are also exposed to high risk.

Outbreak scenarios in Palestine

The Palestinian Public Health Institute, in collaboration with the World Health Organization and the Advisory Committees of the Ministry of Health, is working on preparing scenarios for the future of the epidemic in the Palestinian territories and has developed scenarios in the West Bank that will be studied and announced. In the Gaza Strip, it was difficult to implement the same scenarios as no endogenous cases are reported up to now. The extremely high population density in the Gaza Strip of 5,200 persons/km2 together with the long incubation period of 14 days according to WHO standard results in a worst-case scenario of 20,000 cases based on the record of Wuhan, i.e. 8 cases per 1,000 citizens. To counter this scenario, we are prepared to take strict closures to flatten the epidemic curve to extend for a longer period of up to 10 months, with an estimated forecast of 2,000 cases per month. It is expected that 20% or 400 of the cases calculated per month will need hospital services. The Gaza European Hospital and surrounding areas have been prepared to accommodate these numbers (Advisory Committee-Gaza). If endogenous cases in Gaza are reported, the Ministry of Health will start case-

investigation and draw on the basis of these data the real pandemic curve to be compared daily with the forecasted curve of 2,000 cases per month and 400 hospitalizations. If the real curve remains below the forecasted curve, this indicates that the system can absorb the patients requiring hospital services. If, however, the real curve is out of the forecasted curve the health system is facing a pandemic beyond its absorption capacity. Decision-makers will have to take then the necessary measures, either to increase the capacity of the health system or to establish stronger measures of isolation and social spacing, details outlined as follows.

Palestinian strategies to control the COVID-19 pandemic:

1. Prevention of infection through social distance, personal hygiene, and use of protective devices.
2. Virus containment through controlling entrance at border crossings by quarantine of travelers.
3. Health care facilities preparedness and handling of the discovered cases.
4. Early discovery of cases by PCR testing and contact tracing.
5. Continuation of essential health services for the population.
6. Surveillance and response based on the situation in Palestine and neighboring countries

1. Prevention of infection through social distance, personal hygiene, and use of protective devices

Facing a virus without specific treatment and without vaccines to prevent, we have to work in two directions, the first one is personal hygiene and environmental protection and the second is the social distance. Prevention of infection will be applied at three levels:

- Support health education programs propagating the importance of wearing facemasks and the need to wash hands and disinfect surfaces of furniture and work offices.
- Closing overcrowded places such as schools, universities, mosques, sport clubs, wedding halls, funeral homes, and major markets.
- Isolation of communities with confirmed cases either by curfew or movement restriction between communities.

In the West Bank, the three levels were implemented while in the Gaza Strip activities were limited to the first 2 levels as zero cases were reported outside the quarantine departments. In Gaza overcrowding continues in the markets and streets and the population has been encouraged by the false feeling of security, i.e. that the virus will not enter the Gaza Strip. As there are high rates of unemployment, which exceeds 70% among the youth, and daily individual work became the only means of achieving a limited income for thousands of Palestinian families, the deteriorated economic status prevents the public to respond to social distance and reduced overcrowding in the markets. Local voices call for curfew application for the entire Gaza Strip, but ethical considerations are to be considered too as people should be

provided with basic needs as food, drink, safety measures, and medications for chronically ill people but the funds are not available to cover these expenses.

2. Virus containment through controlling border crossings by quarantine of travelers

Crossings with Jordan and Egypt have been closed, but the crossings with Israel are facing problems due to the multiplicity of crossing points in the West Bank and the loss of security control by Palestinian guards in areas "C". A large number of workers – estimated to be around 180,000 - pass through these crossings. They constitute the largest risk of virus transmission from Israel to the Palestinian territories. According to reports from the Palestinian Ministry of Health, 75% of the positive cases reported in Palestine are workers returning from inside Israel and their contacts. As regards the Gaza Strip there is only scarce movement across borders due to the Israeli restrictions. Besides, there are only two crossings, the Beit Hanon (Eretz) crossing for those coming through Israeli and the Rafah crossing for those coming through Egypt. Returnees from these crossings were required to be quarantined for two weeks, the quarantine policy to be compulsory within school buildings. The process was initially severely disturbed and the facilities not equipped for quarantine, lacking provision of basic needs. Based on this experience a policy was developed for the quarantine process:

- Provision of daily basic needs such as food, drinks, medicine, and communications to all inhabitants.
- Ensuring that infections do not reach and spread within quarantine centers.
- Procedures to prevent spread of infections outside the centers.

Quarantine measures in the early phase have been extended to some hotels and health institutions. Within a short period, 1,000 single quarantine rooms have been replaced in school buildings. The quarantine period in Gaza exceeded the 14 days recommended by WHO by an extra week to take into consideration possible incubation periods longer than 2 weeks.

3. Health care facilities preparedness and handling of discovered cases

There is a small isolation hospital in the Gaza Strip with a capacity of 35 beds and 6 intensive care beds for positive cases located close to the Egyptian border. The European hospital and surrounding areas have been set up to accommodate 400 cases to face the expansion of the epidemic. In the West Bank, 13 hospitals were selected to isolate positive cases. In Jerusalem, isolation departments have been set up at Augusta Victoria Hospital, St. Joseph's and Makassed hospitals (13). Respirator rate in Palestine is 10 devices per 100,000 citizens and 4 in the Gaza Strip. Compared to other countries, these rates are 30 in Germany and 50 in Israel while Israelis are seeking to raise them to 150 devices per 100,000 inhabitants. Many countries are investing a lot on more devices, Germany for example has increased the health system's capacity to add 10,000 units. The United States of America has spent $2.9 billion to acquire 19,000 devices more In contrast, the possibilities of the Palestinian Authority do not allow the purchase of any new equipment.

Obtaining an effective drug or obtaining a protective vaccine requires a longer time, because it takes meticulous scientific, legal and ethical procedures, starting with the identification of the genetic map of the virus and followed by success to form the required substance and its approval from international and scientific institutions such as the FDA. Then the drug or vaccine has to pass successfully in experimental animals, followed by guarantees of safety and effectiveness in humans and the authorization of testing the product on humans in small groups followed by large groups. If successful the compound is displayed for manufacturing and marketing and then WHO and experts will determine which categories should receive this drug or vaccine with adherence to the prohibitions of use if necessary. Therefore, a long time is needed to produce a suitable drug or vaccine. Also some compounds are considered as promising that have been used previously in the treatment e.g. of malaria with Chloroquine or Hydroxychloroquine (14). Another example is the Oxford vaccine based on previous trials of MERS and Remdesivir which has been successful in treating Ebola, SARS and MERS in laboratories but has not achieved clinically relevant results at that time. Clinical trials are underway to determine the appropriate dose and treatment periods for use in Corona therapy. At the same time, WHO is conducting a large-scale solidarity trial that aims to rapidly discover whether any of the drugs slow disease progression or improve survival in different parts of the world including such as Remdesivir and Lopinavir/Ritonavir with Interferon beta-1a. Accordingly, the Advisory Committee recommended not to rush to use drugs or vaccines that have not been proven globally and to wait for stronger evidence.

People acquire long-term immunity to any microbe in one of two ways, either by vaccination or getting sick and recovering from a disease. From the advocates of the herd immunity scenario it is understood that 70% of a population should be infected which implies a high rate of case fatalities which is ethically unacceptable. Therefore, social spacing remains for the time being the best and safest option to deal with the COVID-19 pandemic. Social spacing is expected to reduce the transmission, leading to a significant reduction in the epidemic dynamics. The PNA has excellent health teams but a severe shortage of diagnostic facilities and equipment. Therefore the main focus should be on personal hygiene social spacing.

4. Early discovery of cases by PCR testing

In the Gaza Strip, all arrivals to quarantine centers are examined physically and by PCR testing. This strategy has succeeded in detecting 66 cases up to date in Gaza, preventing epidemic expansion among the population. In the West Bank, all arrivals across the Jordan Bridge were screened by PCR testing. The success of this strategy depends on the availability of a sufficient number of PCR swaps and kits.

5. Continuation of essential health services for the population

WHO recommends that health services to the population continue to be provided in the face of the epidemic, particularly immunization programs and care of chronic patients. Some health centers were closed because of curfew in the WB and subsequent reallocation of health staff to

work in isolation units. In the Gaza Strip 37 out of a total of 54 government centers are open. Non-governmental health institutions provide also basic services to the population as the government sector is busy confronting the epidemic. UNRWA provides excellent primary health-care activities by establishing a public hotline to provide people with home treatment and health consultations and is ready to reach all those registered for non-communicable disease services at home, as well as to provide social assistance at home to avoid overcrowding in the centers. The agency also continued vaccination programs. During disease outbreaks and emergencies, the Advisory Committee stresses the importance of maintaining basic health services such as immunization, and effectively involving NGOs and communities in health planning and service provision (15, 16, 17).

6. Surveillance and response based on the situation in Palestine and neighboring countries

WHO advises in principle not to rush back to normal life before the final elimination of the epidemic, but there is public pressure to return to open markets and mosques accompanied by a government eagerness to boost the economy and increase government incomes. WHO therefore recommends a return gradually to normal life, at least in communities with low risk. However, decision-makers should link the mitigation plan to pandemic indicators over time, i.e. to follow up on the rate of positive laboratory tests, the rate of growth and change over time of multiplication (number of new cases due to one source contact), to determine the effectiveness of these measures, to tighten them and mitigate them as the epidemic changes.

The economic burden

The current pandemic overburdens the system and aborts the response to population health needs. The economic factor is a major component responsible for variations between countries. Israel allocated $2.8 billion to control the current pandemic i.e. to cover treatment and drugs as well as social insurance to their inhabitants. PNA has no resources either to ensure the cost of the pandemic nor to ensure social insurance for the population. It is worthy to mention that GDP per capita in Israel is 15 folds higher than in Palestine. These economic variations are reflected the daily activities to control the pandemic. By the end of March, all examined blood samples for early detection amounted to 830 in Palestine while in Israel health authorities examined daily around 4000 blood samples. By early June 2020 the number of tests in Israel is almost more than tenfold as compared to Palestine, 593,499 vs. 44,876 or 11,637/100,000 vs. 1,360.

It is noteworthy that the economic factor played a major role in the public's failure to accept preventive measures, even though people are aware of the seriousness of the matter. In the northern governorates, thousands of workers and their families still work within Israel as a primary source of livelihood and the interruption of work will lose their entire income, which leads them to continue their work and move between the workplace and their places of residence.

Planning and funding

Based on the WHO guidelines health authorities in the Gaza Strip and the West Bank have developed strategic plans to address the epidemic. Prevention, and treatment protocols have been developed in quarantine departments, contact tracing and follow-up of cases, and estimates of expected costs. WHO has been involved in the work of the various committees. Among the global strategic goals, WHO has recommended that government sectors mobilize all community sectors to ensure that they are responsible for reporting and reducing the number of cases through citizen hygiene practices and physical spacing between individuals.

Financial estimates, prepared by the Ministry of Health, estimated $137 million for Palestine in total. WHO has issued an appeal for $6.5 million for funding activities of the Ministry of Health, UNRWA, and some health NGOs. Financial estimates have also been developed at the Ministry of Health in Gaza. The Health Cluster April 2020 report states: "To respond to the growing health needs of COVID, the Health Group requires a total of $19 million". Having received $10.8 million a funding gap of $8.2 million remains. Health Group partners require $37.5 million to meet the health needs of the most vulnerable communities in the Occupied Palestinian Territory for 2020. To date, a total of $10 million has been secured so far, leaving a gap of $27.5 million (18). No reports have been issued of the donor response, and everyone is looking forward to prepare a single strategic plan to address the epidemic, cover the requirements of the Palestinian people, develop treatment protocols, and organize uniform and broader community participation to control the epidemic.

The main coordination deficit: Absence of a Palestinian central national committee

Facing the current pandemic different technical and administrative committees were formed in the Gaza Strip and the West Bank with minimum coordination. Committee members were mostly official governmental employees, universities were invited to participate in epidemiological and consultative committees, and NGOs to participate in administrative committees.

The absence of a central national coordination committee for both West Bank and Gaza resulted in a poor estimation of the needs, miscommunication with the donor community, an unclear role of the health care providers, and unfair distribution of resources. Many delegates asked to expand the role of NGOs, where their role is not clear and limited to clinical activities. Furthermore Technical and administrative protocols have been prepared separately for the West Bank and the Gaza Strip without full communication between Palestinian experts and as well resource allocation and requests for funding were poorly coordinated.

Recommendations

1. Until the development of a COVID-19 vaccine, the constant urge to **support the policy of social distance and personal hygiene** among the population is the best, safest and most acceptable option to deal with the pandemic.
2. **Establishment of central national committee** presenting Governmental and non-governmental sectors to revise and set policies to control the spread of the epidemic,

seek funding, define roles of players and ensure the equitable distribution of resources among the partners.

3. **Review the diagnostic and treatment protocols** and update them according to international evidence-based recommendations and continue as well the training of health care providers and volunteer teams.

4. **Train community groups** regarding personal protective devices and environmental and personal hygiene.

5. **Community involvement and participation** to support the official authority in the field implementation of their plans and activities. Clearly defined tasks are needed.

6. **Support economic development** to establish solutions to solve problems related to working conditions within the Green-Line and advocate for productive jobs within the Palestinian land.

7. **Urge donors to provide** health authorities with laboratory diagnostic materials, personal protective devices, strengthening intensive care units, supporting outreach activities and training programs.

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1.7 Case study: How the largest slum in India flattened the COVID curve

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Abstract
Mumbai-The economic capital of India, shrivelled with panic as its infamous slum 'Dharavi' recorded its first positive case of COVID-19 on 1st April 2020. Dharavi is the largest slum in India and one of the most denselypopulated areas in the world. Its narrow lanes, teeming with people and chock-a-block with settlements, make physical distancing practically impossible-posing as an excellent breeding ground for the deadly virus. However, with a policy of 'chasing the virus' based on strategy of 'Tracing Tracking Testing and Treating' Dharavi flattened its epidemic curve within a hundred days. This was achieved through the immediate public health response with strict containment measures, aggressive active and passive surveillance and integration of resources from government and private sectors to provide essential services. In this paper, we have summarized the ongoing measures for successful prevention and control of COVID-19 in Dharavi, which could provide useful learning for other similar settings worldwide.

Keywords: containment measures, COVID-19, India, megacity-slum, Mumbai.

Background
On the first day of April 2020 when the first case of COVID-19 got diagnosed with subsequent death in Baliga Nagar Dharavi, Mumbai authorities sensed their worst nightmare was about to begin. People feared that the deadly virus may have already possibly taken a firm grip on the overcrowded shanties. What followed next was several deaths one after another as the SARS CoV-2 virus started spreading swiftly even amidst nationwide lockdown with a growth rate of 12% and doubling period of 18 days (1 2). It took a little over a fortnight for Dharavi to add 100 cases to its tally and by May 3, it crossed the 500 mark. Till May 6, the doubling rate of COVID-19 cases in Dharavi was shortened to six days. Subsequently, Dharavi emerged as one of the most challenging hotspots in India (3).

Multiples strict measures to contain the spread have been implemented since the beginning of the outbreak in Dharavi in April 2020. These measures resulted in the low spread of cases and reduced mortality by June 2020.

This paper aims to focus on documenting the control measures taken to stop the spread of COVID-19 in one of the world's densest slums. The information presented in the paper was obtained through the analysis of recent policies, official press, articles, reports, presentations, and credible data sources. A thematic approach to analysis was used to identify the emerging lessons, which then informed the structure of the reported results. MS excel and Google Maps were used for processing the data and preparing spot maps of the containment zone.

I. What makes Dharavi such a ticking time bomb?

Located in the G North municipal ward of Mumbai, Dharavi is home to around 1 million people living in a 2.16 square kilometers maze of narrow, haphazard, dirty lanes, in shanties and ramshackle buildings next to open sewers. Its narrow passages, overcrowded houses, miserable, unsafe and unhygienic living conditions offer the perfect breeding ground for pathogens like SARS CoV-2 (4).

Figure 1.7/1: Administrative map of Mumbai with Ward Divisions (4)

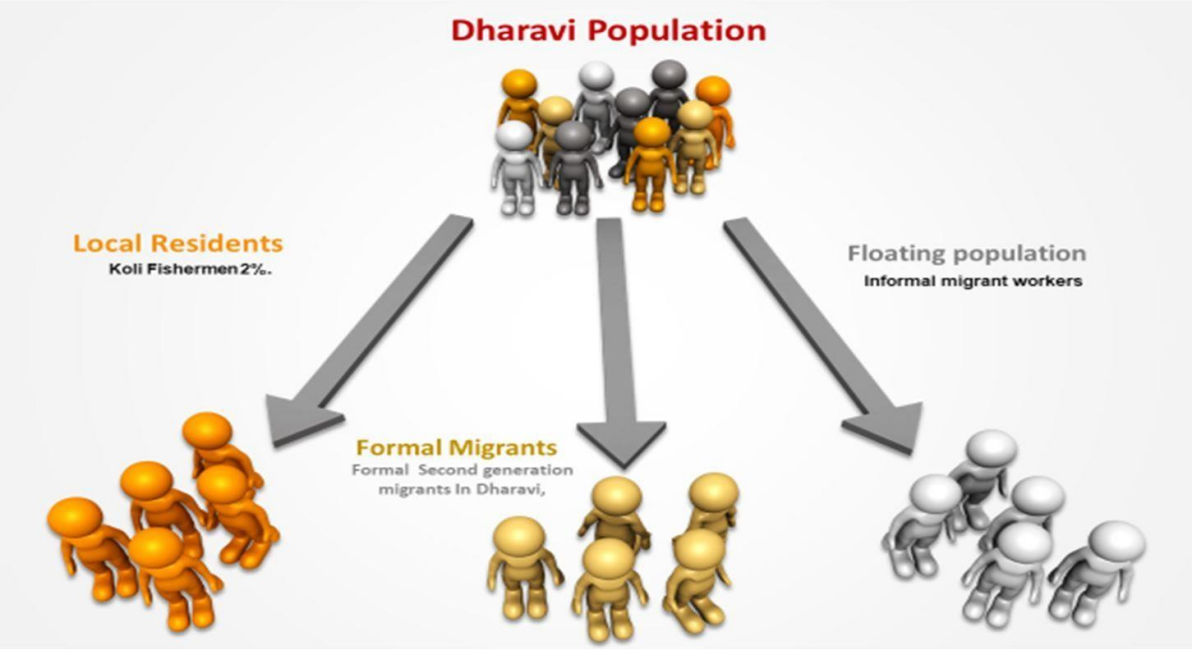
* Dharavi is located in G North ward of Mumbai with Mahim & Dadar.

II. The Socio-demographic Milieu

Dharavi is home to an estimated one million people with a population density of 270,000 per square kilometer, living mostly in G+1 low rise building, where upper floor act as factories (2). They mostly eke out a living as factory workers in some 5,000 small factories and 15,000 single-room workshops of leather, pottery and textile stitching businesses. Many of its residents' work as helpers and chauffeurs to the financial capital Mumbai's well-heeled residents. Dharavi also serves as the plastic recycling hub of Mumbai.

The original inhabitants of Dharavi were Kolis the fishermen but today their number is less than 2%. Majority of Dharavi population is made of migrants both formal and informal mostly from other districts of Maharashtra, Tamil Nadu, Gujrat, UP and Bihar (5). There has been slight increase of migrants from UP and Bihar over the last few years, and they mostly form the informal floating population of Dharavi. Most of them are informal daily-wage workers who don't cook at home and go out to get their food on daily basis.

Figure 1.7/2: Segmentation of residents living in Dharavi*



* Formal Migrants are mostly from states of other parts of Maharashtra, Gujrat and Tamilnadu, whereas floating population is mostly from states of Uttar Pradesh & Bihar

The situation became worse for the migrant workers when in view of the ongoing COVID-19 pandemic, India went into nationwide lockdown on March 25 2020, for maintaining adequate social distance to stop spread of the disease (1). Many of the migrant workers living in Dharavi left for their villages before the lockdown could be strictly implemented, possibly taking the virus far and wide. However, an even bigger number of migrant workers were struck in the slum with no money to buy food or other essential items.

III. Unsafe Physical Environment

Urban slums of Dharavi constitute one of the most disadvantaged sections of society. Health is a major challenge in the slums of Dharavi, were the struggles to maintain it are faced with multi-layered challenges like:

a. Overcrowding: In Dharavi eight to 10 people live typically in a cramped 150 sq. ft shanty with no natural light or ventilation and without provision for safe drinking water, sanitation or other basic services.

b. Poor Sanitation: Most of the (80%) slum households did not have a private toilet facility inside their homes (2). The limited public lavatories they share are filthy, unhygienic and unsafe. Mahim Creek is a local river that is widely used by local residents for open urination and defecation. Also, the open sewers in the city drain to this creek facilitating the spread of contagious diseases.

c. Unsafe Drinking water: In Dharavi 30% of the residents don't have kitchen in their houses and depend on outside food (6,7). Almost 35% of the residents need to step out of their homes to collect drinking water from public taps, tube wells, and wells stationed

throughout the slum (6,7). Insanitary conditions coupled with people crowding around public taps and toilets makes social distancing impossible. Also, hourly restrictions on water availability adds to the challenge of washing hands to keep away from infection.

There is low acceptance for preventive measures amidst other pressing challenges like food, water and shelter. Even simple precautionary measure like regular hand washing and physical distancing are privileges they are unable to afford. They only realize the need for health when it is lost and then most of them are not in position to afford existing medical services. In addition, within a densely packed slum like Dharavi many people lack even a postal address, which itself poses unique challenges for health care services.

IV. The First Few COVID-19 cases and contacts transmission investigation (FFX)

The index case reportedly was a 56-year-old garment unit owner living in a 320 sqm flat in Slum Rehabilitation Authority (SRA) Colony, Baliga Nagar. He initially developed mild cough and fever on 23rd April [8]. When his symptoms worsened even after consulting a local doctor, he was referred and admitted to the civic-run Sion Hospital where his throat swab was sent for testing. By the time the reports came positive for COVID-19 he succumbed to the disease.

A five-member team consisting of two medical officers, a sanitary inspector (SI) and two community health volunteers (CHVs) started contact tracing to identify source of infection and plan how to contain it. The team fanned out in the area to inspect the building and the common spaces between closely constructed squad of five buildings. The area had eight buildings comprising of 300 flats and 91 shops (8,9).

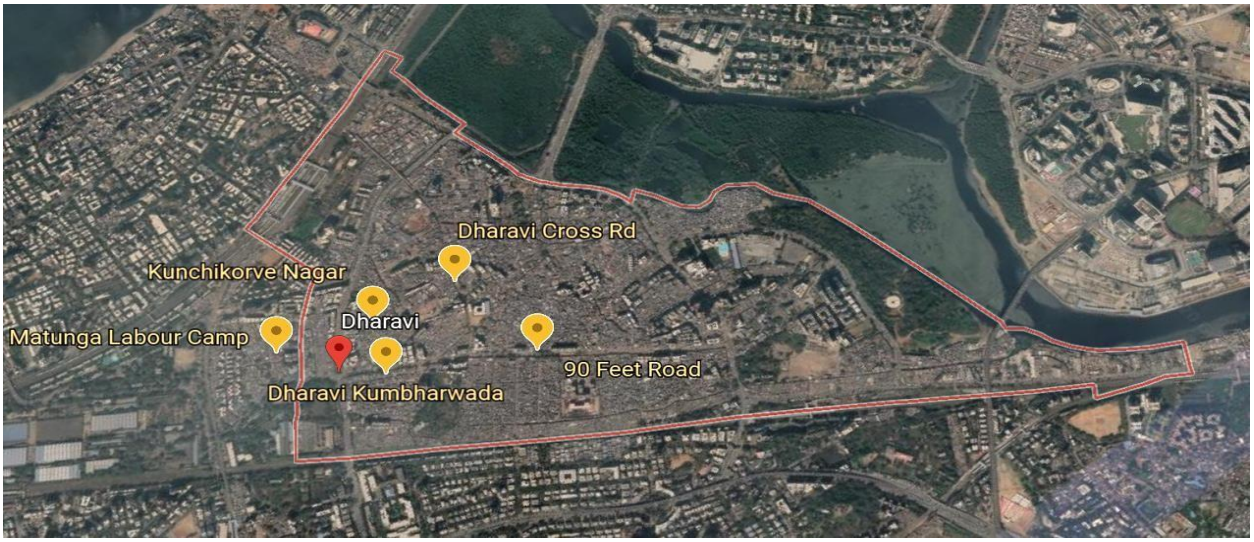
During contact tracing it was found that the index case had possibly hosted some people who had attended a religious congregation in Nizamuddin Delhi in March, which was India's first big cluster of COVID-19 cases (10). Based on contact tracing, a list of 15 immediate high-risk contacts including the deceased's wife, his four sons, two daughters, immediate neighbors, the local doctor the man had visited and two of the staff at the doctor's clinic were identified and tested. The family's acquaintances were categorized as low risk and alerted. With the help of pest control officers (PCO) the entire building was disinfected and sealed. The Sion Hospital OPD, was shifted outdoors while the building was sanitized.

The entire Baliga Nagar Housing Society was sealed and declared containment zone with about 2,500 residents stamped for quarantine. In parallel, a nearby sports complex was converted into a 300-bed facility for isolation. A team of police was stationed outside the colony to ensure the quarantine is not violated. A containment officer (CO) was deployed at the site to coordinate with the police, the BMC and the residents to ensure the residents get essential supplies like food, milk, water and medicines every day. In addition, six volunteers were identified who could step out for essentials on rotation basis. Elderly people with co-morbidities like hypertension, asthma and diabetes were screened and nine particularly vulnerable people with respiratory illness were tested. Apart from it, 75 people who came in contact of the visitors from Delhi were isolated, in an attempt to break the chain of infection.

Second case was reported within 24 hrs as a 52-year-old conservancy worker from Worli who was on duty in Dharavi. Third case was of a surgeon resident of Vaibhav Apartment in Dharavi, who was working with one private Hospital, which had earlier reported many infections among its healthcare workers. The doctor's wife also tested positive later. So, all these cases had different source of exposure and were in building setup. The real alarm was set off on 4th April when a positive case was reported from a slum shanty of Mukund Nagar, where a 48-year-old-man living with his 11 family members in a two-room house (100 sq. ft) came positive.

Due to emerging of multiple cases from multiple parts of Dharavi, medical camps were started to screen people in areas with multiple cases. Gauging the increasing spread Maharashtra Medical Council officials in collaboration with BMC started active surveillance of cases by door-to-door screening. By 25th April total 214 active cases and 13 deaths were recorded mostly from the areas of Mukund Nagar, Azad Nagar, Dharavi Cross Road, Matunga Labour Camp and Indira Nagar. Individual slum pockets were grouped together to form high risk zones based on the case load. Five such slum pockets in Dharavi were identified as hot spots and marked as high risk/red zones (11).

Figure 1.7/3: Spatial distribution of five high-risk zones for COVID-19 outbreak in Dharavi as on 25th April 2020



Legend:

Dharavi

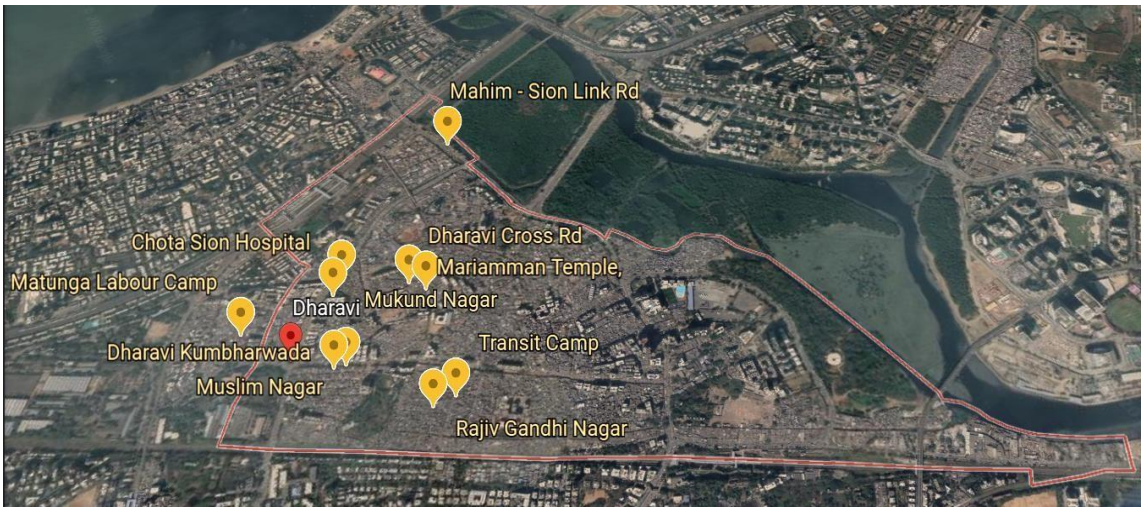
Borders of Dharavi

5 Hot Spots of COVID-19 (Dharavi Kumbharwada, Dharavi Cross Road, Matunga Labour camp, KunchiKorve Nagar, 90 Feet Road)

Within a span of one month, around four lakh residents in Dharavi were screened for the symptoms of Covid-19 by teams of 24 health practitioners. Around 47,500 people were screened in high-risk zones by door-to-door visits by doctors and private clinics, about 14,970 people were screened with the help of Mobile Vans, and rest were surveyed by BMC health workers. Out of these 2,000 were suspect cases and 600 were subjected to tests. Following the screening, about 5,857 were put in institutional quarantine and 31,725 residents were directed to remain under home quarantine. Also, around 8246 Senior Citizens were surveyed and as part of its policy of 'Timely Separation' from the other community to effectively limit the transmission (2).

Even with all ongoing activities, a whopping 1,400 COVID-19 patients were added to the tally by mid-May, a figure almost 380 percent higher than the April figures. With a rise in containment zones to 202 from a mere 49 such zones at the end of April, the hotspots or high-risk zones increased to 10 from five with Matunga Labour Camp, 90 ft road, Dharavi Cross Road, Kunchi Korve Nagar being the particular focus areas due to rising cases (12).

Figure 1.7/4: Spatial distribution of high-risk zones of Dharavi as on 23rd May 2020



Legend:

Dharavi

Borders of Dharavi

10 Hot Spots of COVID-19 (Mahim Sion Link road, Rajiv Gandhi Nagar, Mukund Nagar, Marlyamma temple, Muslim Nagar, Transit Camp, Kumbharwada, Matunga Labour Camp, Chota Sion Hospital and Dharavi Cross Road)

The maximum number of cases in Dharavi were reported from the Matunga Labour Camp (55 cases), followed by Mukund Nagar (49 cases), Kumbharwada (45 cases) and Dharavi Cross Road (38 cases). Majority of cases in Dharavi (75%) were reported in people aged 21 to 60 years. Almost 35% of the cases had contracted infection within their families. Dharavi also reported increased mortality due to Covid10 in May (70 deaths) in comparison with April (18 deaths).

V. Specific processes and activities in implementation of 'Mission Dharavi'

Under the clear leadership of Brihan Mumbai Corporation (BMC) - the local civic body which is Asia's richest municipality, **Mission Dharavi** was launched with a slew of proactive steps to contain the virus (13). At the heart of Mission Dharavi, the motto was to chase the Virus by Tracing Tracking Testing & Treating. 'Corona war room' was launched in the disaster control unit for various activities like planning, prevention and management of the pandemic 24/7 functional. Early diagnosis and early treatment were key measures to reduce the new infection and mortality rates. The major activities conducted under 'Mission Dharavi' are as follows:

1. Focused High risk areas with Watertight Containment zones: BMC's COVID containment strategy included identification of maximum possible containment zones, these are places where positives have been detected and those surrounding areas have been sealed to protect

everyone inside and outside from further spread (13). The containment zones were further classified into the following for the purpose of triaging and focused efforts (14):

a. Red which are congested areas;
b. Orange which are congested, but still more manageable than red;
c. Blue which are the buildings.

The state government chalked out a three-fold strategy of an effective containment, conducting comprehensive testing and ensuring uninterrupted supply of goods and essential supplies to the community. To make sure the harsh containment worked, officials partnered with non-profits to provide free meals rations and medicine to the residents and migrant workers left jobless by a weeks-long nationwide lockdown. Community kitchen were opened to provide food packets (2). The G-north ward also launched a 12-hour helpline number to help people contact BMC for food, grocery, transportation and stay. Social media platforms were used to inform residents about relief efforts.

2. Perimeter control: To maintain the perimeter control, police were deputed. Considering the overcrowding, BMC started monitoring movements within the red zones by drones which alerted police if residents attempted to leave their homes and a fine was imposed. Local leaders and youth of the area were identified as volunteers named "Corona Yodhdhas" (Corona warriors) to help the community with procurement of essential commodities. Free meals and food rations were provided to residents trapped at home without work and income.

3. Early Diagnosis: Early detection and treatment are of utmost importance for favourable outcomes and reducing the mortality rates (Figure 4). Dharavi was not only dealing with an increased number of cases but also increased mortality. It was seen that those who were brought late to the facility had higher mortality rates. To ensure early detection of disease targeted testing approach was tried. **a. Aggressive active surveillance:** Screening effort involving door to door active surveillance, taking help of private clinics/doctors, were conducted. Teams comprising of Community health volunteers (CHVs) and local COVID volunteers under the leadership of the Medical officer conducted door to door active surveillance for cases. Each team in personal protective gear on an average visited 100-150 households of high risk and low risk contacts and screened them for fever and oxygen concentration with the help of thermal guns and pulse oximetry. Altogether 47,500 people from the high-risk zones and 1.25 lakh residents of containment zones of Dharavi were screened (2). This became a game changer. **b. Passive surveillance at Fever Camps**: Fever camps were conducted at regular intervals in strategic locations of the slum. At each camp about 80-100 residents were screened every day by Medical officer with the help of health workers for fever and blood oxygen levels using infrared thermometers and pulse oximeters. The local private practitioners were also instructed to report and refer all the patients with fever or /and respiratory symptoms like cough, sore throat and shortness of breath to the fever clinics for further testing. Those who tested positive were moved to local institutional quarantine facilities with the guidance of health workers.

4. Early Treatment with Triaging of Facilities:

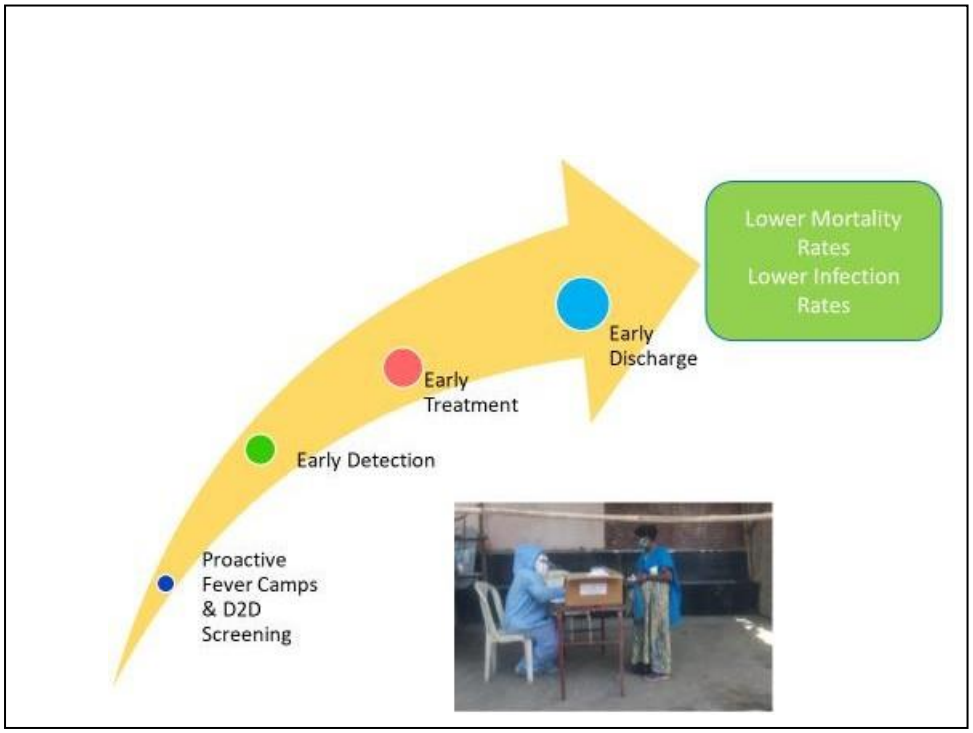
To ensure proper utilization of limited resources medical care centres for COVID 19 were divided in four categories (13):

a. Corona Care Centre Type 1 (CCC1): These facilities were meant for high-risk contacts and those awaiting reports and were arranged in hotels, lodges, halls or newly constructed buildings, and they don't have round-the clock medical staff;
b. Corona Care Centre Type 2 (CCC2) facilities for asymptomatic to mild positive patients. They have round-the clock medical staff and oxygen facilities. Food, multi-vitamins and medicines are supplied free of cost to the people admitted;
c. Dedicated COVID health centre (DCHC) for moderate to critical patients;
d. Dedicated COVID Hospital (DCH) for critical patients. There are five covid-19 dedicated hospitals, Sai Hospital, Ayush Hospital, Life Case Hospital, Family Care Hospital and Prabhat Nursing Home, for residents of Dharavi.

The triaging helped in judicial utilization of resources and only critical patients were shifted for admission to hospitals and ICUs. Centralized toll-free number for live availability of ICU beds was generated for the community. Ambulances and mobile vans with oxygen facility to transfer patients from CCC1/CCC2 to DCH as and when required were made available.

Because of these proactive steps, even with limited resources the virus was detected early and promptly treated, increasing the recovery rates and lowering the mortality rates. Dharavi reported recovery rate of about 51% as compared to 41% in the rest of Mumbai, where most patients reached hospitals late. Also, almost 90% of the patients were treated inside Dharavi itself (2).

Figure 1.7/5: Strategy for reducing the new infection rates and mortality due to COVID-19



5. Institutional Quarantine facilities: Instead of putting people in home quarantine, the government decided to put high-risk people from Dharavi in institutional quarantine because at home they were still sharing the public toilet. In order to increase the capacity of Quarantine Centers, makeshift shelters and transit camps were erected. Schools, colleges, hotels, lodges, marriage halls, sports complexes were transformed into quarantine centres, equipped with facilities like lights, fans, charging points & daily usable. The G North ward prepared a capacity of about 3,000 quarantine beds in facilities like Rajiv Gandhi Sports Complex, Dharavi Municipal School, Manohar Joshi Vidyalaya, D'silva High School, Ruparel College Hostel, Scout & Guide Hall, Mahim Nature Park, and various other hotels and lodges in the ward. The ratio of Positive to institutional quarantined ratio increased to 1:5.45 in May from 1:3.381 in April (15). Every person in the isolation centers received three meals and round-the-clock medical supervision free of cost. Taking care of the religious sentiments during Ramadan -- the Muslim holy month, authorities ensured they got fruits and dates and distributed proper meals at appropriate times for breaking their religious fasts at sunset. Such activities increased the acceptance of institutional quarantine in the community. Also, mental health aspect of quarantine inmates was taken care of with the help of dedicated counsellors, yoga and meditation sessions.

6. Improved Sanitation: Poor sanitation in community toilets in Dharavi have been the key source of spread of infectious diseases like COVID. In order to improve sanitation, the 225 public toilets were disinfected and fumigated twice daily. The G North Ward also installed foot

operated devices for using washbasins, toilet flush, and so on. Public awareness campaigns about sanitising hands and washrooms were regularly conducted (16).

7. Social mobilization processes were undertaken, exploring opportunities and innovative means to bring together all societal influences to raise awareness, like local leaders and Bollywood stars to assist in the delivery of services and resources. It included:

a. Community Engagement: Community engagement is central to any public health intervention even more so during public health emergencies. It involves those affected in understanding the vulnerabilities they face, and involves them in response actions. The Dharavi model adopted the process of working collaboratively with and through groups of people in the affected community to address issues to bring about environmental and behavioural changes that will improve the health of the community members. This involved recruitment of local volunteers to influence and serve as catalysts for changing practices, reaching out to and informing the community of policy directions of the government and build community awareness and understanding. Frontline health workers played critical roles in the prevention by providing health education on preventive measures for all people in the containment zones. The transparency of updated information and clear communication messages on COVID-19 through official and social media were important contributors to changing community behaviours towards wearing masks, hand washing, and social distancing, from February 2020.

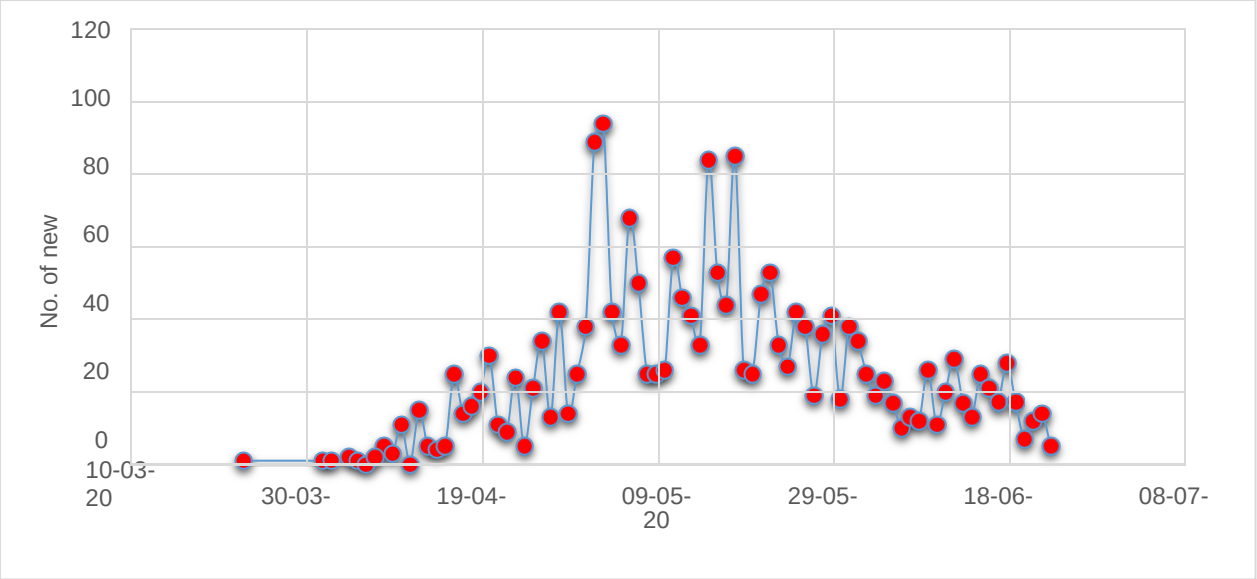
b. Public Private Partnership (PPP): Even when COVID Care facilities were ready, arrangement of manpower to run them was a real challenge. To tackle the issue of trained health workforce strategic public private partnerships were forged and all available 'private' practitioners from the nine Dispensaries and 350 private clinics located in Dharavi were roped in. All practitioners were encouraged and supported with resources to open their clinics to attend to the patients and communicate to BMC in case any COVID-19 suspects were found. The added advantage of including the private practitioners was that they had the trust and confidence of the residents who will approach them even for slight fever, or any other symptoms making it easy for screen and test.

8. Exodus of Migrants*:* Apart from the above initiatives, reverse migration of thousands of migrant workers residing in Dharavi, towards their homes in other states also contributed directly and indirectly towards decreasing the case load in Dharavi.

VI. Temporal Variation of cases and the epidemic curve

With the strategy of actively 'chasing the virus', the epidemic curve of Dharavi displayed signs of flattening by late May 2020. A steady decline in the number of COVID-19 cases was observed in late May which continued in June when daily reported new infections dropped to 5 cases in third week of June from a high of 94 cases a day in early May (13).

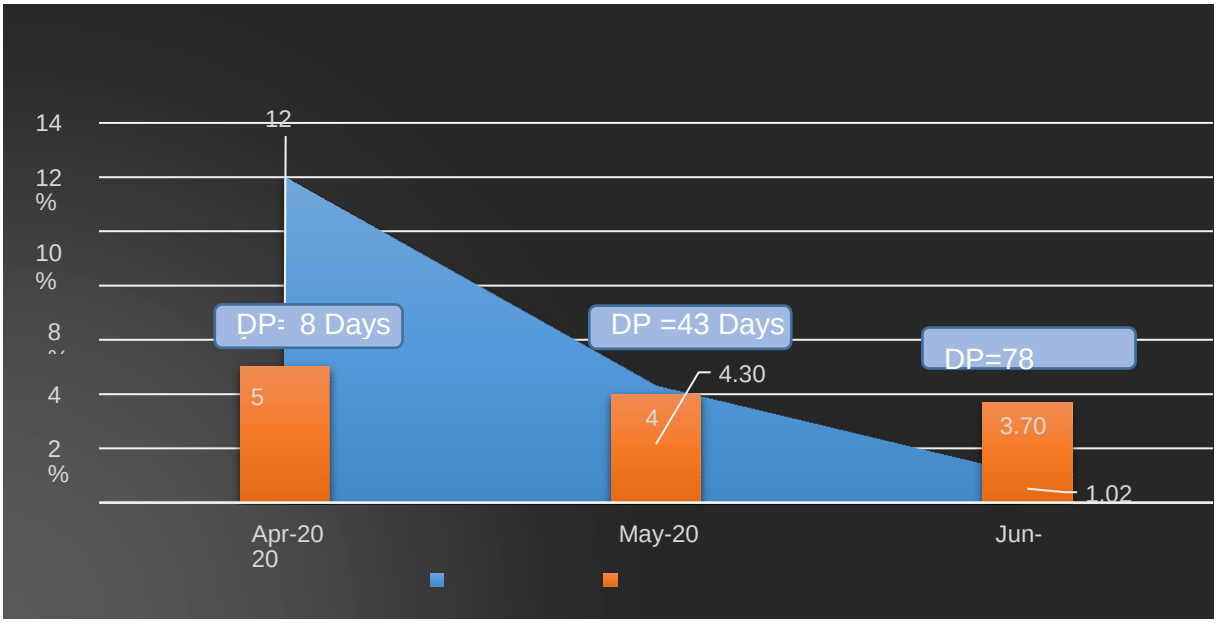
Figure. 1.7/6: Temporal variation in number of new COVID-19 cases in Dharavi



Legends: **No. of cases**

The drop in the new cases in Dharavi was also associated with a steep rise in the doubling time of 18 days in the last week of April to 78 days as of June 19. The growth rate declined to 1.02% and the case fatality rate dipped to 3.7% by the month of June (2,13).

Figure 1.7/7: Comparative analysis of COVID 19 growth rate and doubling time for Dharavi



The Ministry of Health and Family Welfare (MoHFW) also mobilized provision of medical equipment and organized several site visits for central inter-ministerial and public health teams to support local health facilities to prepare for combating COVID-19.

VII. Challenges

Dharavi's war against the virus is still far from over. The severe lockdown measures can't continue forever. Though relief efforts for providing food and ration are continued in the area, many are still not able to procure them and are forced to step out of their home to arrange meals. Upcoming monsoon with waterlogging can pose a serious threat on the makeshift quarantine facilities. Also, monsoon will increase the burden of other communicable diseases like Dengue and Malaria, which will further overburden the health system. With the unlock and start of local trains, buses and other modes of transportation the virus can easily make its way back to the slum. The community still lack awareness, and many are ignorant to preventive measures like wearing masks properly and maintaining physical distance. Hence, the chances of a second wave in near future cannot be denied. Arranging trained health workforce and ICU beds can be difficult with the already overburdened health workers and health system. Therefore, there should be continued administrative measures and screening at all points of entry till the virus is chased out from the state and the country which is again a challenge.

Conclusions

Almost a hundred days after Dharavi began its fight against Covid-19, Asia's largest slum seems to have flattened the curve. The Dharavi model is based on the dogged approach to "chase the virus" by screening, contact-tracing and isolating infected patients along with multi-sectoral approach, social mobilization and community engagement. However, for sustaining the 'Mission Dharavi win', it is important to resolve the environment and sanitation issues on a long-term basis.

This chase the virus approach could also be used as an example in similar settings like slums in Pakistan, Bangladesh, favelas of Brazil or shanty towns in South Africa. However, the wider applicability of these experiences is subject to differences in socio-political environments and further remodeling of this strategy can be done to fit the context-specific needs of the affected communities.

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2.0 Environmental sustainability

The One Health concept relates all components of the planet earth to each other as there are Air, water, land, plants, animals and humans. Each of these is conditional for the survival of mankind and we are responsible in the first line for our own survival and therefore have to take care for the entire environment. In this chapter the concept of One Health is introduced and described in some of its most relevant facets.

2.1 Climate change and biodiversity (Victoria Ormea, Richard Seifman)

Major environmental challenges have occurred throughout much of history as a result of human actions which have affected oceans, seas, freshwater, and land, as well as the biodiversity and ecosystems. Taken together, and with ongoing modernization it has made it increasingly possible for known and unknown viruses, bacteria, prions, fungi (spores) and parasites (worms and protozoa) and other pathogens to affect us all. Since 1920 COVID-19 is everywhere but it is only the latest infectious disease that has grown into a pandemic. The Plague of Athens in 430 B.C. is estimated to have resulted in the death of 25% of the population of Athens at the time, probably from typhus fever[38]. The first virus species which infected humans was discovered in 1901 with yellow fever - now there are 219 such species and more likely exist. Viruses can infect non-human hosts such as mammals and birds, and vice versa[39]. From1990-2021 we have had multiple epidemics or pandemics, including swine influenza, other corona epidemics such as SARS and MERS, Zika and COVID-19 many of these zoonotic in origin. While technology for detection, diagnosis and treatment has improved, what has accelerated is transmission because of enormous global population growth, ease of travel, urbanization, economic activity, all of which has heightened vulnerabilities not only for humans but for animals and plants as well. In sum, the subject has become a higher priority, one which needs heightened attention[40].

The book 'Limits to Growth' (Donella et al. 1972), which predicted our civilization would probably collapse sometime this century, has been criticized as doomsday fantasy since it was published[41]. The predictions were very dramatic - "If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity" (Brown, 1974). We still have 50 years to disprove the prediction. Something must be done.

[38] https://pubmed.ncbi.nlm.nih.gov/1978765F8/
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[41] https://info.populationmedia.org/blog/a-coronavirus-mash-up-for-ecological-realists

New Environmental health - the concept of ecological public health:
Public health thinking needs to be broadened and modernized to include and integrate concepts of ecological health which is multidimensional, encompassing material, biological, social and cultural aspects. In essence, a key mandate of public health is in transforming the relationship between people, their circumstances, and the biological world of nature and bodies.[42] It requires taking into account long-term transitions, factors such as change, demography, economies, epidemiology, urbanization, culture, and forms of governance, to name only a few. Identifying large scale transitions such are these will necessitate, refocusing public health actions to those conditions where human health and eco-system interact (Ryener 2012).

Traditionally the relationship between environment and health was presented as the relation between a hazardous state of the environment and its effect on health and Wellbeing. The European Union model "*ecosystems-enriched Drivers, Pressures, State, Exposure, Effects, Actions" (*DPSEEA), adopted by the WHO to configure an environment and health information system, shows the link between the environmental state and a resulting health effect. It also makes explicit that environmental conditions result from environmental pressures caused by higher level (often anthropogenic) drivers. Additionally, it makes clear that actions (including policies) could be directed towards any point on the causal chain to effect health. The modified DPSEEA model (or mDPSEEA) recognised that whether an individual or group within society was exposed to an environmental state or indeed, whether they went on to experience health effects, was influenced by social and economic factors (Morris et al. 2006). Recognising that mDPSEEA better represents the complex interaction of social, behavioural, economic, physical and other factors with individual characteristics, gives the model greater policy relevance (Morris et al. 2006). The modified DPSEEA model has proven useful as a tool both to think about health and the environment, but also to communicate in a policy arena dominated by complexity.

There is no integrated model that includes all the relevant factors for environment, (human) health, and Wellbeing in relation to a sustainable society with the exception of One Health. That said, some aspects are addressed in mDPSEEA which incorporate human health with ecosystems health, or the framework for integrated environmental health impact assessment of systemic risks that focuses on the broad range of questions decision makers are facing[43].

Human influence on the climate system is obvious, and anthropogenic emissions of greenhouse gases today are the highest in history. Recent climate changes have had widespread impact on human and natural systems. Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented. The atmosphere and oceans have warmed, the amounts of snow and ice have diminished, and sea levels have risen. Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to

[42] https://www.routledge.com/Ecological-Public-Health-Reshaping-the-Conditions-for-Good-Health/Rayner-Lang/p/book/9781844078325

[43] http://www.unfccc.org.mk/content/Documents/ADAPTATION/HEALTH-Dragan%20Gjorgjev.pdf

atmospheric concentrations of carbon dioxide, methane, and nitrous oxide that are unprecedented in at least the last 800,000 years. The effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely to have been the dominant cause of the observed warming since the mid-20th century (Intergovernmental Panel on Climate Change (IPCC) 2014).

Dragan Gjorgjev[44] noticed: 'All climate and weather variables have some influence on human health. The effect may be either direct on the human body or indirect through effects on disease-causing organisms or their vectors. Direct effects involve mostly physical impacts that act to cause physiologic stress (e.g., temperature) or bodily injury (e.g., storms, floods). Direct effects tend to be observed soon after the causative weather event, and are generally more easily modelled and understood than indirect effects. On the other hand, indirect effects, such as climate impacts on food supplies and the outbreak of vector-borne diseases, may operate through diverse pathways involving multiple variables. People with chronic diseases, especially the elderly, are very susceptible to aggravation of the disease state from both excessively cold and excessively hot weather. Temperatures in warmer temperate zones are ideal for the survival and propagation of causative agents for some bacterial, viral, and parasitic diseases. Temperature also affects human health by affecting agriculture, fisheries, and water resources. The effects of high temperatures on human health are modified by the amount of moisture in the air. Climate change could affect human health through increases in heat-stress morbidity and mortality, tropical vector-borne diseases, urban air pollution problems and allergies, and cold-related illnesses.'

Human health will continue to be affected directly and indirectly by climate change, and health systems will need to act to prevent and manage the impacts on populations. At the same time, health services will face various other complicating challenges such as rising costs of health care an ageing society, new and previously unknown infectious diseases, making effective preventive strategies even more necessary and challenging.

The effect of climate change on health could be diminished or avoided by applying different adaptations. The primary goal of an adaptation strategy would be to decrease the burden of diseases, injuries, disabilities, suffer and mortality. Indeed, many key determinants of health, and the solutions, lie primarily outside the direct control of health systems. Important mechanisms for disease prevention originating from water and food are traceable: microbiological risk assessment, risk communication and risk management. For example, salmonella cases could be dramatically diminished with better control and monitoring of the entire food chain.

Proposed early warning and reporting systems for possible health impacts from weather changes aim to identify and assess health risks and create prospects for diminshing effects. Such instruments would include promotion and timely alerts to the affected populations, particularly vulnerable groups, of impending extreme weather events. Various entities can

[44] http://www.unfccc.org.mk/content/Documents/ADAPTATION/HEALTH-Dragan%20Gjorgjev.pdf

contribute, from public sector agencies to non-governmental organizations, the latter increasingly playing an important role with regard to populations with high social risk factors. Strengthening the capacities of government, non-government organizations, and the private sector can heighten prospects of pathways to sustainable adaptable strategies and palliative strategies. Multiple sectors will be involved, including education, social welfare, agriculture, the economy, legal systems and government policy as well as public and private institutions which will inform and perform services for the population.

A critical factor in determining morbidity and mortality will be weather projection - monitoring and response capability. It can inform the preparedness and response of health services, adequate infrastructure and physical planning and housing. To be effective, and depending on the geolocation, the system should include the implementation of preventive action plans for heat waves, extreme cold, droughts, and inclusion of complementary strategies. Public health monitoring and citizen campaigns promotion are essential to translate preventive and response plans into concrete and effective action. In sum, the instruments for risk reduction shall contribute to promotion and timely warning forecasting extreme weather events impacting on the society and especially vulnerable groups (MoEPP 2014).

Capacity building is an essential step in preparing sustainable adaptation and mitigation strategies. To provide guidance a handbook was introduced for national vulnerability, impact and adaptation assessments which stresses involvement of as many different stakeholders as is feasible to identify potential vulnerabilities. Among others the guidance includes determining the current situation including demographic and socio-economic factors, health systems, epidemiologic factors, and information from non-health sectors. The findings can then inform public health adaptation programs that strategically leverage existing strengths and mitigate the future weaknesses of health systems. (ECDC 2010; WHO 2013)

Environmental health indicators (EHIs), according to Hambling et al. (2011)[45], provide information about 'the scientifically based linkage between the environment and health, enabling the conversion of data to information by summarizing these complex relationships and presenting them in a form that is more easily interpreted by the end-user. EHIs can be used as a tool to assess, quantify, and monitor ecosystem health vulnerability from a sustainability perspective and can be utilized to inform adaptations and policy development and measure the effectiveness of climate change adaptation and mitigation activities. In addition, EHIs provide baseline information for assessing and monitoring temporal and spatial variability of risks with respect to climate change, enabling projection scenarios (e.g. epidemics, cost/benefits of interventions) of how the current situation may evolve. Monitoring of human disease surveillance data has the potential to act as a warning system for ecosystem disruption and may be used to identify interventions for the preservation of ecologic and human health. Such an approach means that interventions can be applied higher up the causal chain than would have been possible based on environmental monitoring or health surveillance alone. Implementation of such interventions can improve ecological Wellbeing which in turn will reduce the resultant

[45] https://haifa.esr.cri.nz/assets/Environmental-Health-Indicator-Tool.pdf

burden of disease in humans'. This requires conceptual insights[46] beyond the conventional understanding of causation and prevention as well as political will, trust, and resources. The complexities of policies to mitigate human-induced climate change are clear. Meanwhile, additional resources and strategies will be needed to reduce the health risks related to global change that have already arisen or are now unavoidable. For populations to live sustainably and with good long-term health, the health sector will have to work collaboratively with other sectors in reshaping how human societies plan, build, move, produce, consume, share, and generate energy (Mc Michael. 2013).

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2.2 The One Health and Wellbeing concept (Veronica Ormea)

The World Health Organization (Kahn 2019), describes the One Health concept as "an approach which focusses on designing and implementing programs, policies, legislation and research while multiple sectors interact to achieve better public health outcomes"[47]. It presumes that human and animal health are linked to the health of the ecosystem in which they exist (OIE 2020)[48].

According to the One Health Initiative (One Health Commission 2016), the One Health concept highlights that most human illnesses in history are caused by zoonotic (lower animal infections) along with environmental factors. In order to express the scope of the One Health approach, the diagram below expresses the concept with an umbrella developed by One Health Sweden and the One Health Initiative (Figure 2.2/1). In this diagram, scientific fields are interconnected. These scientific fields go from environment health to ecology, veterinary medicine, human medicine to end in health economics. While research and education are issues not highlighted in the diagram they should be seen as implicit part of the coverage (Lerner et al. 2015).

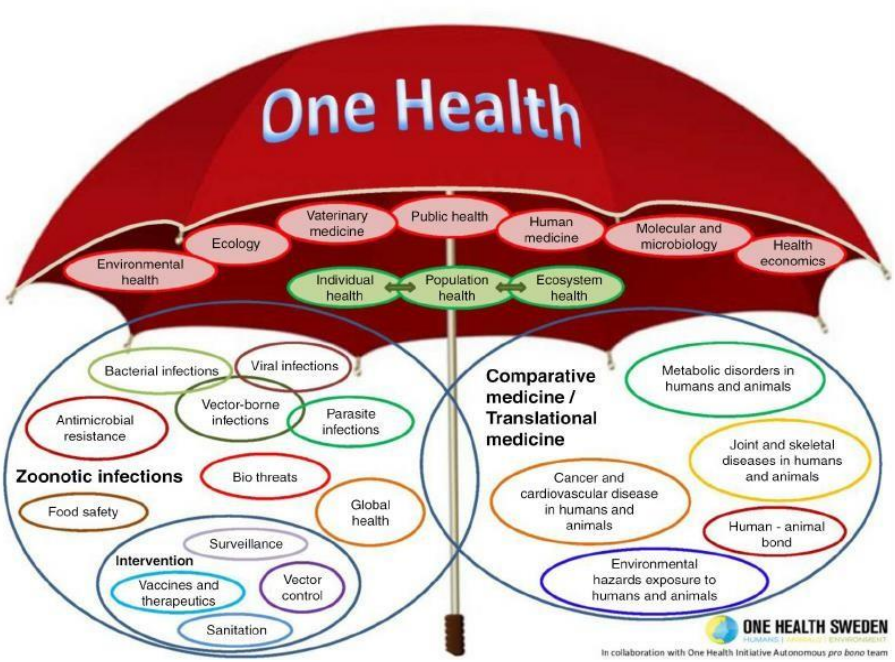
The constant interaction between animals, society and environment helps in the presentation of diseases. The risk of zoonotic diseases increases with pathogen innate factors but also with external factors like globalization, climate change and human behavior. These conditions increase the opportunity of pathogens to spillover or transmit between new hosts.

Addressing threats to human health and Wellbeing requires 'expanding communication and interdisciplinary collaboration with regard to all dimensions of the health of humans, animals and the environment - local and global. The One Health Initiative[49] re-enforces this observation noting that:

- World-wide, nearly 75 percent of all emerging human infectious diseases in the past three decades originated in animals.
- Environmental health may affect human and animal health through contamination, pollution and poor conditions that may lead to new infectious agents.
- The world population is projected to grow from 7 billion in 2011 to 9 billion by 2050 and in order 'to provide adequate healthcare, food, and water for the growing global population, the health professions, and their related disciplines and institutions, must work together.[50]

[47] Available at: https://www.who.int/news-room/q-a-detail/One Health
[48] Available at: https://www.oie.int/en/for-the-media/onehealth/
[49] Available at: https://doi.org/10.3389/fvets.2018.00014
[50] The One Health umbrella. Available at: www.onehealthinitiative.com.

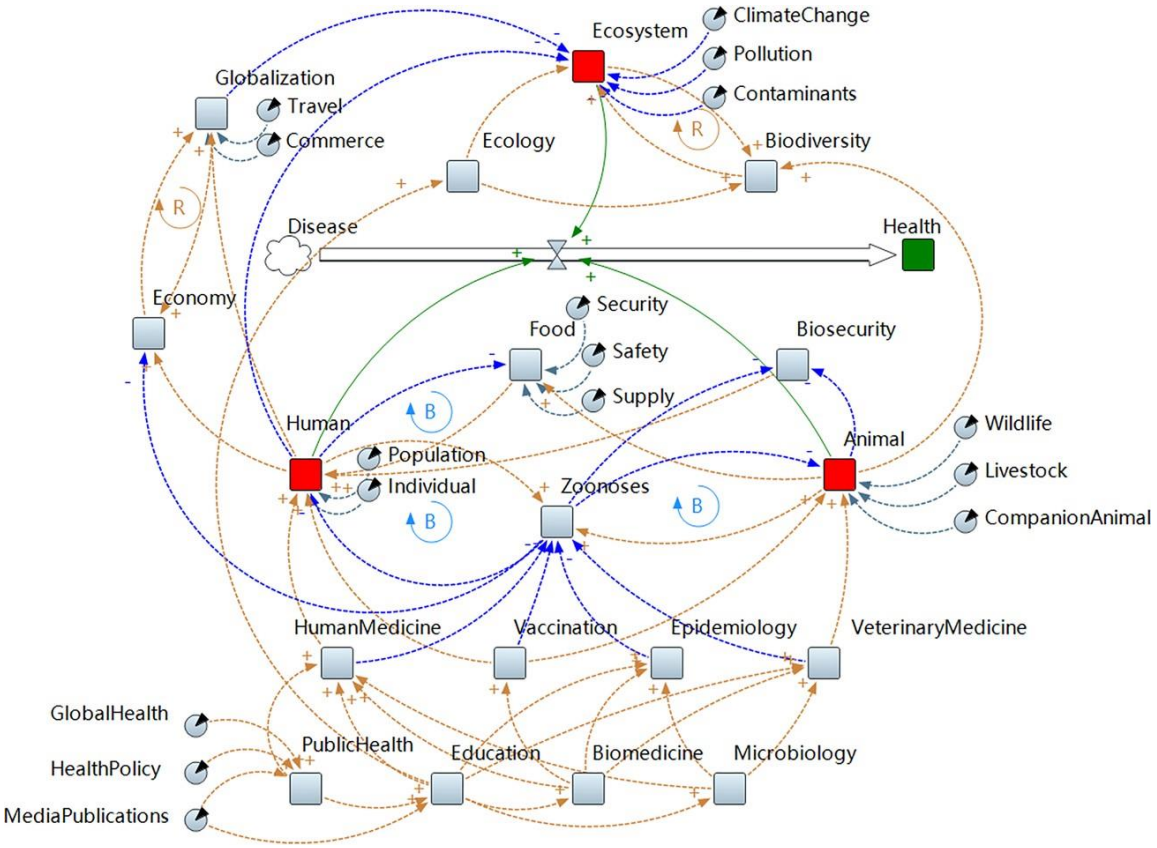
Figure 2.2/1. The One Health umbrella.



The One Health concept is not new. Rudolf Virchow (1821-1902), a German physician, social reformer, politician, and anthropologist in the 19th century asserted that there is no dividing line between animal and human medicine. He developed a strong interest in the bond between human and veterinary medicine as a pillar for comparative medicine (Saunders 2000). Later, Calvin Schwabe (1984), formulated the term "One Medicine" to recognize that human and veterinary medicine contribute to each other. This term "One Medicine" was later extended to One Health in order to consider societies, health and Wellbeing. In 2004 the Manhattan principles were developed which recognize that wildlife health and Wellbeing - which involves wildlife animals and their own habitat - depend on communities and livestock health (Osofsky et al., 2005).

A more recent diagram using mathematical modelling provides a presentation to understand complex problems in addressing an interdisciplinary approach such as the One Health. (Figure 2.2/2). This model shows the interconnectedness of education in the realm of One Health topics while it links education to epidemiology, human and veterinary medicine, ecology, microbiology and biomedicine (Xie et al. 2017).

Figure 2.2/2. A system dynamics approach to understanding the One Health concept.



The concept of One Health has emerged from integrated research on zoonoses but has further expanded to other fields, such as antimicrobial resistance, ecotoxicology, or health in urban environments (Destoumieux-Garzón et al. 2018; Hitziger et al. 2018). The One Health approach can be applied in the study and control of zoonotic diseases, to mitigate the consequences of climate change and degradation of the environment. The emergence of zoonotic diseases is a multifactorial event. It is multifaceted encompassing society (changes in human behavior, farming, trading, and customs), pathogen (genetics, pathogenicity, distribution) and ecosystem dynamics (temperature, climate, biodiversity), and ecosystem health as climate and habitat changes have a significant effect on pathogen and species distribution (Zinsstag 2011). As we have seen with the COVID-19 pandemic, which originated from animal origins, a zoonotic infection can affect virtually every corner of the globe, sector and Wellbeing of people.

2.2.1 Policies in One Health

According to WHO, 'One Health is an approach to designing and implementing programs, policies, legislation and research in multiple sectors that communicate and work together to achieve public health outcomes' (WHO 2017). As earlier noted, the numbers and complexity of known pathogens have grown massively, but policy frameworks have not kept pace. There

is an urgent need at global, national and regional levels to put in place public policies which address the emergence and spillover of infectious diseases and are designed with appropriate measures to control and prevent disease outbreaks. To implement the One Health approach, policies must be based on the foundation of scientific studies that integrate microbiology, epidemiology, ecology, social science as well as economic science[51].

Such public policies rely on epidemiological studies to develop effective disease prevention strategies (Kahn 2019). One Health provides a useful framework for researching, analyzing and addressing complex interactions between multifactorial health challenges in terms of the interdisciplinary, intersectoral and multi-institutional aspects. It postulates knowledge integration at every stage of policy development, in every policy cycle, to strengthen coordination and governance to benefit society (Hitziger et al. 2018).

2.2.2 Ecosystem and human Wellbeing

'A better knowledge of causes and consequences of certain human activities, lifestyles, and behaviors in ecosystems is crucial for a rigorous interpretation of disease dynamics and to drive public. When one considers the multiple factors at play and the complexity of public health issues, it is clear policies' (Destoumieux-Garzón et al. 2018), the One Health holistic approach cannot be dissociated from the notion of ecological health (EcoHealth). The underlying premise is that health and Wellbeing of the human population will be more and more difficult to maintain on a polluted planet suffering from social or political instability and ever-diminishing resources (Destoumieux-Garzón et al. 2018).

Threats to health like endemic and emerging infectious, and zoonotic diseases have a direct impact on a country´s economy and affect developmental priorities like agriculture, education, nutrition, social welfare (Berthe et al. 2018). The Sustainable Development Goals (SDGs) are the aspirational plans to achieve a better and sustainable future for all. Virtually all of them directly or indirectly address the need to interact with the ecosystem and animal health while giving a prior importance to the Wellbeing of all living beings.

The following SDGs directly address the One Health approach:

- SDG3 (Good Health and Wellbeing) promotes that we must ensure healthy lives and promote Wellbeing for all at all ages.
- SDG 6 (Clean water and sanitation) promotes ensuring availability and sustainable management of water and sanitation for all
- SDG11 (Sustainable cities and communities) promotes the concept of making cities and human settlements inclusive, safe, resilient, and sustainable.
- SDG13 (Climate action) promotes the concept of take urgent action to combat climate change and its impacts.

[51] https://fems-microbiology.org/One Health-policy/

- SDG14 (Life below water) promotes conserving and sustainability use of oceans, seas, and marine resources
- SDG15 (Life on land) promotes protection, restoration and sustainable use of terrestrial ecosystems, sustainably manage forests, halt desertification, and reverse land degradation and loss of biodiversity.[52]

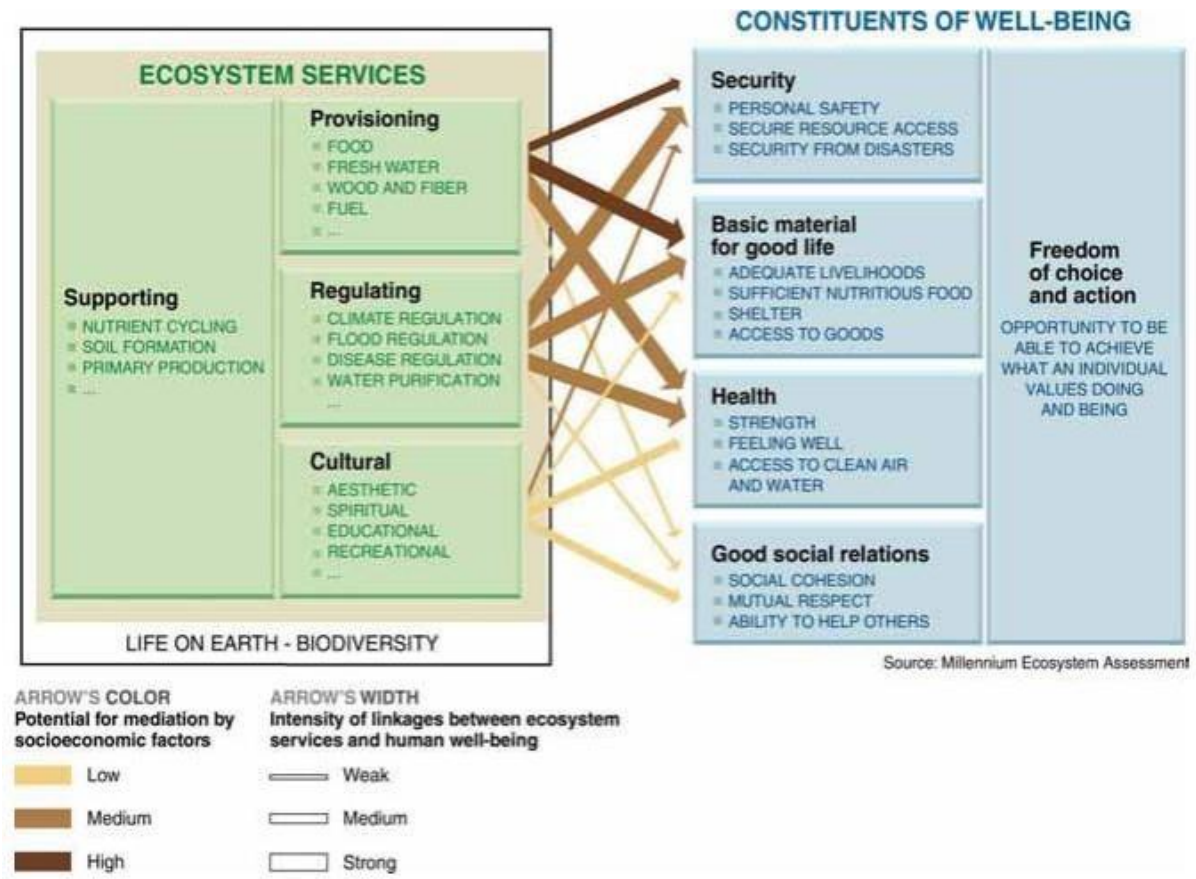
2.2.3 Smart cities, green buildings

Scenarios show that by 2030 around 60% and by 2050 around 70% of human population will live in urban areas. Increased economic opportunities and cultural offerings are among the drivers of this trend. Integrated pathways are characterized by high connectivity and 'smartness' of cities. The digital revolution and the availability of autonomous, high-speed transport options however change the nature of urbanization with more people able to connect to the dynamism and services offered by cities in more remote locations, leading to increased integration of the urban hinterland. The rapid urbanization process, however, also poses challenges. The emergence of polycentric, urban-rural landscapes in conjunction with the digital revolution facilitates the rapid uptake of more localized technologies and production processes such as building integrated, smart home systems, urban farming or advanced on-site printing of things, such that cities overall are becoming more self-sufficient, less polluting, and circular in terms of resource consumption.

Further characteristics that define cities in the integrated pathway (Figure 2.2/3) are inclusiveness, access to open spaces (including green areas) and a high level of social interaction. This is achieved, among other means, through a paradigm shift in housing policies that do not any longer lead to segregation by class or race and where housing is no longer considered a purely private matter but an essential component of a larger social system giving people better opportunities to connect with each other thus reducing 'urban anonymity'. As these improvements take place gradually, informal settlements will be transformed organically. A striking indicator reflecting this progress is the share of people who have access to an improved water source. It reaches 100% in 2030, depicting potential progress towards minimum adequate housing standards and inclusiveness. Paramount to all pathway elements is the capacity of urban city planners to design policies which respect the rights of all city dwellers and contribute to the basic drivers of human Wellbeing such as security, trust, local identities, and lively neighborhoods.

[52] Available at: https://helloreniu.com/

Figure 2.2/3: Linkages between ecosystem services and human Wellbeing[53]



Factors undermining the health and Wellbeing of millions are environmental conditions which threaten health contributing to disease burdens. It is estimated that "Some 60% of the world's vital ecosystems are degraded or being subjected to unsustainable pressures" (Yoti 2013). It is also noteworthy that 'Many of the ultimate drivers of environment and health conditions lie outside the direct responsibilities of the relevant sectors. Rogers et al (Rogers et al. 2012) emphasize that: Socioeconomic inequality is not just an ethical issue: research shows that it also is a factor in many of the problems of the world. A positive association between lower socioeconomic status and higher mortality has been well documented in contemporary populations. Inequality may promote conflict within and between ethnic groups, classes and societies, and drive international immigration. It appears to raise prevalence of poor health, mental illness, crime, violence, and other societal ills. Inequality reduces cultural diversity through the disempowerment of local minority communities. It may inhibit economic growth in developing countries, reduce sustainability, promote corruption, and play a role in destabilizing economies.

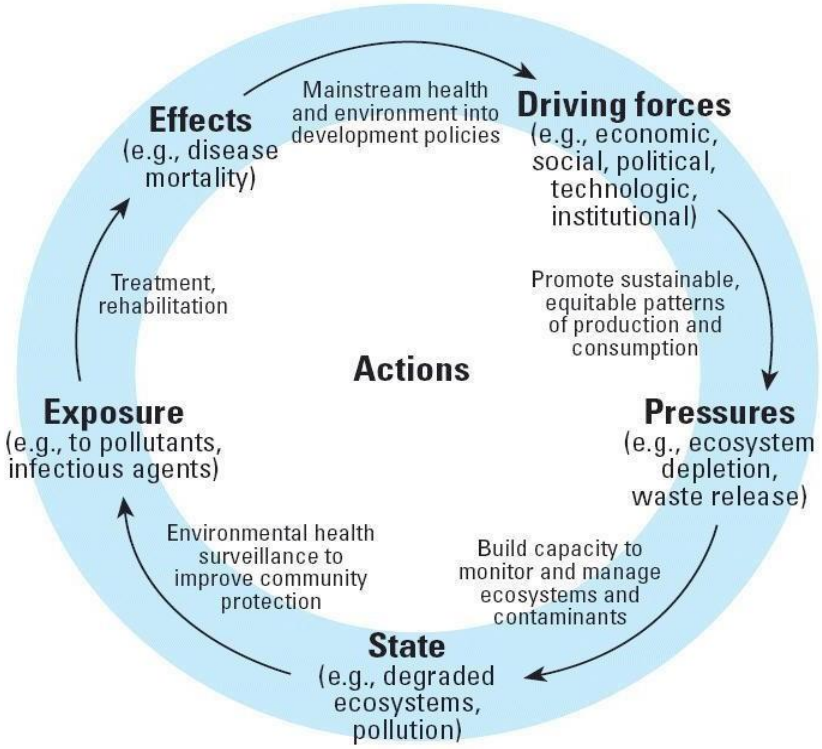
[53] Source: http://documents1.worldbank.org/curated/en/703711517234402168/pdf/123023-REVISED-PUBLIC-World-Bank-One Health-Framework-2018.pdf

Three major findings of the seminal Millennium "Ecosystems and Human Wellbeing" synthesis report (WHO 2005) include, first, 'The goals of ecological sustainability and human health are mutually reinforcing'; second 'Choices made about the management of ecosystems can have important consequences for health, and vice versa'; and, third, while 'the health sector can make an important contribution to reducing the damage caused by environmental disruptions', research shows that 'the greatest gains would be made by interventions that are partly or wholly placed in other sectors'.

Achieving the goal of enhancing human Wellbeing while conserving ecosystems, the authors assert that 'Wide-ranging reforms of governance, institutions, laws and policies are required'. In addition, they underscore the point that 'Effective management cannot focus on a single approach (markets, local control, government control etc.)', and that 'response strategies must be tailored to the specific social and environmental context. The overall conclusion is that while 'some of the threats can be addressed by the health or environment sectors acting alone', many cannot and, ideally informed by the One Health concept 'require the development of integrated policies that address health, environment and development goals coherently'[54], as illustrated in Figure 2.2/4.

[54] Available at: https://www.unenvironment.org/explore-topics/chemicals-waste/what-we-do/policy-and-governance/health-and-environment-strategic

Figure 2.2/4: Driving Force-Pressure-State-Exposure-Effect-Action (DFPSEEA) framework



2.2.4 Available Tools

The One Health Tool[55] is software designed to inform national strategic health planning in Low- and Middle-Income Countries. It is particularly useful in that it links strategic objectives and targets of disease control and prevention programs to needed investments in health systems rather than build on costing tools which take a narrow disease-specific approach. Outputs will help planners answer the following questions:

- What would be the health system resources needed to implement the strategic health plan (e.g., number of nurses and doctors required over the next 5-10 years)?
- How much would the strategic plan cost, by year and by input?
- What is the estimated health impact?
- How do costs compare with estimated available financing?

This One Health Tool is overseen by the UN Inter Agency Working Group on Costing (IAWG-Costing) with WHO technical support and has been applied in more than 25 countries to date, most of which in Sub-Saharan Africa.

[55] WHO INT: https://www.who.int/choice/onehealthtool/en/

An additional One Health tool is the Health and Environment Linkages Initiative (HELI)[56] developed by WHO and UNEP which encourages countries to address health and environment linkages as integral to their economic development. HELI activities include country-level pilot projects and refinement of assessment tools to support decision-making (WHO 2016).

2.2.5 Conclusion

This chapter has presented the multi-sectoral and multidisciplinary challenges which must be considered in addressing environmental sustainability. It provides the context and situation analysis, identifies linkages to Sustainable Development Goals, and underscores the importance of the interaction of animal, human, and environmental health, encapsulated in a One Health perspective and approach.

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2.3 List of possible exercises and case studies on environmental health risk assessment

(Cited from Dragan Gjorgjev et al. 2010)

The following documentation is intended to provide concrete study material for discussion and group work of scholars guided by their lecturers.

a) Report of students, individually or as groups, on their international field practice, group work, seminar paper and/or case problem solving presentations.

b) Climate change (WHO and UK reports)

> Ministry of Environment and Physical Planning MoEPP 2014. Conducting Climate Change Health Vulnerability and Adaptation Assessment in the South East Region of Macedonia. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/371103/Health_Effects_of_Climate_Change_in_the_UK_2012_V13_with_cover_accessible.pdf.
>
> MoEPP, Ministry of Macedonia for Environment and Physical Planning, (2014-1). 3rd National Communication on Climate Change (ISBN 978-9989-110-89-40). Available at: http://unfccc.org.mk/content/Documents/TNP_ANG_FINAL.web.pdf

c) Governance for health and well-being (WHO Reports)

> Search the report, 'Governance for health in the 21st century: a study conducted for the WHO Regional Office for Europe', which highlights that 'Health 'is a major macroeconomic factor and, increasingly, a critical component of business models and strategies. Businesses must reorient themselves towards strategies built on shared values, which can enhance their competitiveness while also advancing social agendas.' Available at: http://www.euro.who.int/ data/assets/pdf_file/0019/154252/Health-2020-Conf.-Governance-for-health .... pdf.
>
> Answer these related questions:
> - What kind of initiatives (at least 3) might 'business' need to consider and ensure that corporate priorities also advance social priorities?
> - To what extent have these initiatives been demonstrated and achieved in your country?

d) Public health governance within a health policy framework

> Read the fact sheet: 'Governance' can be defined as 'the actions of governments and other actors to steer communities, whole countries or even groups of countries in the pursuit of health as integral to well-being through both whole-of-government and

whole-of-society approaches'. Available at: https://www.thecommonwealth-healthhub.net/governance/

Answer these related questions:

- What is meant by 'whole-of-government and whole-of-society approaches'?
- What past developments in public health have led to the current approach?
- To what extent is this approach apparent in your country (three examples)?
- If not widely used, what are the main obstacles blocking these approaches and what are realistic solutions for doing so?

e) Policymaking in the 21st century (WHO Reports)

Read the report:

A key constraint in terms of developing policy in an uncertain world is that 'the amount of evidence is always increasing and it is rarely final'. Available at: http://www.euro.who.int/__data/assets/pdf_file/0019/154252/Health-2020-Conf.-Governance-for-health .... pdf

Answer these related questions:

- What specific examples are there (at least 3) in public health that demonstrate the validity behind this observation?

- As more information is accumulated each day in a networked world, how can policy-makers address these issues now and in the future (at least 3 ideas)?

f) Limitations of addressing contemporary health and well-being issues ()

Read the report:

Germà Pelayo (Forum for a New World Governance n.d.) observes that 'the causes of many of today's unsettling developments relate to an almost permanent demonstration of exclusion and of economic and social inequalities in the low-income districts of towns, both large and small, in every continent. Available at: http://world-governance.rio20.net/author/germateamfngm/

Answer these related questions:

- Do you agree with his conclusion? If so, please provide specific examples from your personal experience where 'inequality is at the root of unsustainable behaviours'.
- What are some of the socioeconomic and geopolitical circumstances that create major challenges?
- Identify four common mechanisms or drivers that can initiate major change and societal transitions.

g) Good inclusive governance and World Bank governance indicators (Search the OHCHR webpage)

According to The Office of the United Nations High Commissioner for Human Rights (OHCHR) 'the true test of good governance is the degree to which it delivers on the promise of human rights i.e. civil, cultural, economic, political and social rights. The key question is are the institutions of governance effectively guaranteeing the right to health, adequate housing, sufficient food, quality education, fair justice, and personal security.'
Available at:
https://www.ohchr.org/EN/Issues/Development/GoodGovernance/Pages/GoodGovernanceIndex.aspx
Answer these related questions:

- To what extent are these criteria being met globally and in your country at this point in time?
- What are the major stumbling blocks - worldwide and nationally?
- What fundamental policies in each of the key components of the Health Systems Policy Framework (Governance, Knowledge, Advocacy, Capacity) might need to be developed and enacted in order to strengthen the government's ability to 'protect, prevent ,and promote' people health and well-being?

h) Governance scores (UNDP 2016 Human Development Report):

Answer these related questions:
Read the report: The World Bank Governance Indicators include 'Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.' Available at:
https://slidelegend.com/human-development-report-2016-human-development-for-undp_5afeee8f8ead0e3e0c8b4570.html

Answer these related questions:

- Select and compare three indicators from five different countries in terms of governance scores (-2.5 to +2.5) as well as percentile rank and account for the different scores.
- Which indicators remain most consistent over time and what are some of the implications for governance generally and health systems policy in particular?

i) Major UN agreements in 2015 and impact on governance
The UN 2030 Agenda for Sustainable Development has been described as the 'biggest decision in history' as it 'asks humans to reconnect with their planet'.

- What were the main outcomes of the Millennium Development Goals (2000-2015) (c. 750 words)?
- For one of the three major UN agreements reached in 2015, provide information (c. 1000 words) in terms of:
- Background and purpose
- Key Factors leading up to the agreement
- Summary of decisions reached, including key actors
- mplications for planners and implementation at global and national levels
- Possible developments or outcome scenarios by 2020 2025 2030

j) Global follow up and review system in re 2030 Agenda (UN Secretary General report 2016)

Read the report: A crucial challenge facing the UN Secretary General and the UN General Assembly is 'how to put in place a coherent, efficient and inclusive follow-up and review system at the global level, within the mandates outlined in the Agenda. Available at:
http://www.fao.org/fileadmin/templates/cfs/Docs1516/OEWG_SDG/CFS_OEWG_2030Agenda_2016_02_24_02_Report_UNSG_on_follow_up_and_review.pdf

Exacerbating the difficulties of SDG reviews may be consideration of progress set against SDG indicators (45) developed for each of the 17 SDGs but that cross and intersect with each other, as illustrated in Figure 13 (in Dodds and Bartram 2016).

Answer this related question:
How might reviews along these lines be coordinated and technically facilitated?

k) Social violence and armed conflicts: effects on environmental health (group exercise)
In this exercise the students will work in small groups and will have three tasks:

Task 1: The students will look at publications on structural and social violence and armed conflicts and discuss the different methodologies used to study and address the effects on environmental health. Available at:
http://www.philadelphia.edu.jo/academics/aalraoush/uploads/Health-Systems-Lifestyle-Policies.pdf

Task 2: The students will apply the human rights approach, the public health approach, and the ecological model to analyze the situation in their countries regarding the multilevel root causes and risk factors for structural and social violence and armed conflicts.

Task 3: Case problem analysis will be used to review the existing and potential evidence-based multilevel prevention measures for structural and social violence and armed conflicts.

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3.0 Toward multilevel 1 HOPE education and transdisciplinary research

Foreword (George Lueddeke)

The article that follows is based on a keynote address in December 2016 at the World Veterinary Association and the World Medical Association One Health conference in Kitakyushu City, Fukuoka Prefecture, Japan. Informed and inspired by colleagues at the One Health Commission and the One Health Initiative, the main aims of the presentation and subsequent invited chapter in the *World Medical Journal* (*WMJ*) provide historical perspectives on the *One Health and Wellbeing* concept as well as the UN-2030 Sustainable Development Goals (SDGs) while raising public awareness of their potential contributions to transforming society.

The subsequent publication of *Survival: One Health, One Planet, One Future* sought to translate rhetoric into reality by examining the state of planet Earth, the changing world order, and creating a 'more just, sustainable and peaceful world,' recommending, as one example, consideration of Ten Propositions for Global Sustainability. Of these, recommendation #7 is perhaps the most pivotal suggesting that the *One Health and Wellbeing* concept with its emphasis on recognizing the interdependencies of humans, animals, plants in a shared environment and multifaceted collaboration can provide a global unity of purpose and become the cornerstone of societal institutions, including education, formal and non-formal. An underlying assumption of the propositions is that the UN SDGs would be the main drivers for transformational change.

Much has changed across the global landscape in the past few years. Climate change continues to be our greatest existential threat. Unquestionably, the Covid-19 pandemic has exposed the most serious shortcomings of our societies especially brought to light by Pope Francis at the launch of the UN-2030 SDGs in September 2015 calling for Peace and Environmental Justice. Not mincing his words, he placed responsibility for global unrest and turbulence squarely on 'a selfish and boundless thirst for power and material prosperity (which) leads both to the misuse of available natural resources and to the exclusion of the weak and disadvantaged.' The decline of democracy, technological hegemony, suppression of human rights coupled with disinformation have added to our global burdens.

With the devastating socio-economic impact of Covid-19, including the epochal reversal of SDG progress -in particular upending the lives of children, it is evident that multidimensional strategies to respond to the pandemic are urgently needed. In terms of power relationships, it has also become clear that the biosphere (Nature) is now in charge of our civilisation - not political entities, the economy nor ideologies. This fundamental socio-economic and political re-orientation forces us to re-examine our worldview on sustainability: shifting from self-interests and exploitation of the Earth at any cost (human-centrism) to ensuring our needs are compatible with those of the planet (eco-centrism). Re-building trust, compassion and resilience is essential for our survival as a species and the preservation of the planet. To this

end, education and research that encourages us 'to become better humans' and nurtures respect for the whole Earth remains our best option for ensuring a sustainable future.

The first step towards sustainable development is to create sustainable livelihoods on a scale that makes an impact on the lives of a significant part of the population. (Dr. Ashok Khosla, Chairman, Development Alternatives).

3.1 Toward One Health & Wellbeing education

The UN Sustainable Development Goals and the One Health Concept: A case for synergistic collaboration toward a common cause (George Lueddeke)

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Introduction and global challenges

The early decades of the 21st century have reminded us of the pressing need to find ways forward for a world that seems to be facing, what some have called, an 'ingenuity gap.' That is, as highlighted in my new book on global population health and Wellbeing[1], we are facing complex and unprecedented socioeconomic, environmental and geopolitical problems for which there appear to be no 'ready-made' solutions. Conventional 20th century reductionist thinking -understand, predict, control, provide - is no longer adequate in an interconnected and uncertain world faced with confronting climate change, conflicts, economic uncertainties, urbanization, social intolerances, ideological extremism, and migration, to name but a few intractable global issues.

On many fronts we seem to be living in a dichotomous world, where 'the gap widens between right and reality.'[2] To illustrate 2 billion out of 7.4 billion people—most in Africa—do not have access to surgical procedures of any kind,[3] and close to a billion people are undernourished, while those who are overweight now number over 1.5 billion. Paradoxically, the number of people who are overweight or obese has increased to over a billion "in countries from Columbia to Kazakhstan," leading to "diabetes, heart disease, and high blood pressure.'[4] And, while there are examples of decreasing global hardships, for example, 'people living on less than $1.25 a day having declined from a high of 1.9 billion in 1981 to a low of 1.4 billion in 2005,' dropping ' from 52.0 to 25.7 per cent during this period,'[5] huge discrepancies remain.

It is becoming increasingly clear that as we head into this century most people – over 5 billion out of around 7.4 billion - live in the global South and East - while resources and services – including most medical and nursing schools- remain largely in the North and West. This imbalance is brought into sharp focus in Africa where the population now exceeds 1.2 billion people with an estimate of 9 billion by the end of this century. Similar to other nations in southeast Asia, 'Africa faces a quadruple burden not only must it tackle communicable diseases (e.g. HIV/AIDS, malaria, tuberculosis, and most recently Ebola), it must also confront an increasing number of non-communicable diseases, many of which can be traced to problems of modernity, where there appears to be considerable incongruence between our lifestyle today and our genetic make-up evolved over millions of years. In addition, poverty illnesses (e.g. perinatal/maternal), violence and injury continue to undermine health and Wellbeing and quality of life in general. The continent has 24% of the world disease burden but only 3% of the world resources and 1% of the doctors. Doctor to people ratios are as high as 50,000:1 in several African countries and over 20,000:1 in several nations, such as Bhutan and Papua New

Guinea. In effect, for many in these nations "health systems," as we define them in the literature, are non-existent. In the North and West the doctor-inhabitant ratio is about 300:1.[6]

And, although globalization has the potential of benefiting everyone, the facts indicate that 'the gap between those who enjoy the fruits of wealth and those who rely on the wage packet for their income' is growing each year,[2] and that, as the latest Ipsos MORI Social Research study has concluded, 'the majority (61%) of populations of 25 nations[57] think their countries are 'off on the wrong track' and that re-direction is required.[7] Given recent events in the UK and the US there can be little doubt that 'people are desperate for big change, and most desperate are the poorer, working class and industrial communities that have borne the brunt of the technological changes and spending cuts of the globalization era.'[8,9]

The UN 2030 Sustainable Development Goals (SDGs)

On 25 September 2015, 193 Member States of the United Nations General Assembly ratified the UN 2030 Sustainable Development Goals (SDGs) or Global Goals, as they are also called.[10] The 17 SDGs and 169 targets superseded the 2000-2015 UN Millennium Development Goals,[11] which, while raising the profile and funding of global health and making variable progress on the eight agreed goals, failed to fully address the broader concept of economic, social and environmental development and, in particular, according to UN Secretary-General Ban Ki-moon, tackling root causes.

Extending the nature and scope of the MDGs dramatically, the SDGs, as shown in Figure 3.1/1, are 'a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.[10] They are intended to be 'integrated and indivisible, global in nature and universally applicable' while 'respecting national policies and priorities.'

According to Johan Rockström, Director of the Stockholm Resilience Center, 'the SDGs are maybe the biggest decision in history…a much more complex agenda, which requires humans to reconnect with their planet.'[12]

[57] Argentina, Australia, Belgium, Brazil, Canada, China, France, Britain, Germany, Hungary, India, Israel, Italy, Japan, Mexico, Poland, Peru, Russia, Saudi Arabia, South Africa, South Korea, Spain, Sweden, Turkey and the United States.

Figure 3.1/1: The UN 2030 Sustainable Development Goals

The SDGs provide a synthesis of major global issues and place collaborative partnerships (#17) at the centre of strategic implementation strategies. Their consideration cannot come too soon as, according to Marco Lambertini, Director General of WWF International, observes in the introduction to the WWF *Living Planet Report 2014* (Summary):

In less than two human generations, population sizes of vertebrate species have dropped by half….These are the living forms that constitute the fabric of the ecosystems which sustain life on Earth—and the barometer of what we are doing to our own planet, our only home. We ignore their decline at our peril.[13]

In his plea for transformative change the Director General challenges global leaders to respond to three main questions: 'What kind of future are we heading toward? ...What kind of future do we want? ... and, can we justify eroding our natural capital and allocating nature's resources so inequitably?'

His concerns go beyond the immediate UN -2030 global goals and demand finding, first and foremost, a lasting '*unity around a common cause*.' His message is intended for the public, private and civil society sectors and implores these stakeholders to be proactive, to "pull together in a bold and coordinated effort"; for Heads of State to think globally; businesses and consumers, 'to stop behaving as if live in a limitless world' - before facing inevitable and potentially disastrous consequences.[13]

Making a fundamental mind shift in this century

The WWF Director-General's core argument also reflects a recurring theme that runs through my current publication.[1] In short, to sustain the planet and its people in the long term requires making a fundamental mind- or paradigm shift this century: moving away from a stance held by many stakeholders, such as Governments and Big Business, that see, as Pope Francis laments, 'the world as a means to an end,'[14] and 'a place made especially for humans and a place without limits'[15] to one that recognizes that the survival of the planet and people depends on evolving a future that is 'compatible with our needs as human beings but also an outer world that is compatible with the needs of our ecosystem.'[15] The overarching goal – the common denominator to pull us together regardless of '*race, color, religion, sex,* or *national origin'*- must surely be creating 'healthy people on a healthy planet.'[16]

One Health historical perspectives and linking the UN global goals to One Health values

The present focus on One Health builds on historical roots going as far back as ancient Greece and Hippocrates (c.500 BCE),[1] and well-known reformers in the 19th century, such as Dr Rudolph Virchow (1821-1902), German physician-pathologist, who coined the term "zoonosis," and Canadian Sir William Osler (1849-1919), father of modern medicine.[17] In the 20th century Sir John McFadyean (1853-1941), a UK veterinarian and physician, considered the 'founder of modern veterinary research, 'built bridges across human veterinary fields in infectious disease and comparative medicine,' while in the US Dr Calvin Schwabe, considered the 'father of Veterinarian Epidemiology,' framed the concept, One Medicine.[17] In the past few decades One Health has been championed by individuals, such as Dr Roger Mahr, former president of the American Veterinarian Medical Association (AVMA), who along with Dr Ron Davis, then president of the American Medical Association (AMA), passed a One Health resolution in 2007. In the intervening years Dr Bruce Kaplan and Dr Laura Kahn, as co-founders, spearheaded the establishment of the One Health Initiative (OHI),[18]while Dr Joann Lindenmeyer and Dr Cheryl Stroud have been leading developments for the One Health Commission (OHC).[19] These organisations complement those in the World Veterinarian Association (WVA),[20]representing over 500,000 veterinarians across the world on six continents, and the World Medical Association (WMA)[21] with 112 Constituent Members and 1013 Associate Members, presently headed by Presidents Dr. René Carlson, and Dr. Desai Ketan, respectively. It appears that for all these inspirational and committed leaders One Health is unquestionably the core concept that represents global 'unity around a common cause' – bringing together human, animal, environmental health and Wellbeing - to which the world needs to aspire and also advocated strongly earlier by the WWF Director General.[13]

Inherent in the One Health concept is the need to adopt ethical responsibilities that are rooted in interdependencies and the sanctity of life,[22] which were also at the root of UNESCO Director-General Irena Bokova's appeal, envisioned a few years ago, for 'a new humanism that reconciles the global and the local, and teaches us anew how to build the world.'[23] Moving in these directions may yet offer us the best chance to "free the human race from the tyranny of

poverty and want and to heal and secure our planet,' espoused in the UN direction-setting report, Transforming our world: the 2030 Agenda for Sustainable Development.[10]

It is for these underlying reasons that governments and organizations, such as the United Nations (e.g., Office for Sustainable Development, the UN High-level Political Forum), the World Health Organization, the World Bank and the Commonwealth, are encouraged to consider adoption of the One Health triad, as shown below (Figure 2) as an integral feature of framing policy and enabling action plans, shifting from a mantra of 'Health in All Policies,' to '*One Health* in All Policies.'[1] As a filter for decision-making, the bottom-line question 'to what extent does the policy initiative/action impact on the sustainability of life on this planet?' seems vital to embedding a critical global common good. Following this path might lead not only to creating 'social benefit' but also 'sustainable economic development and job creation' in the long run.[24]

One Health and Wellbeing: implications for preparing health professionals

In *Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action*,[25] UNESCO highlighted that 'education is the most effective means that society possesses for confronting the challenges of the future.' The significance of this resolve was also captured in the UN's Earth Charter, which emphasises the importance of integrating into 'education and life-long learning the knowledge, values, and skills needed for a sustainable way of life (Principle 9).[22]

More recently, the UN 2030-Sustainable Development Goals (SDGs) reinforce this principle, declaring that by 2030:

All learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development (SDG 4).[10]

Figure 3.1/2: The SDGs and the One Health concept

While the rhetoric is certainly going in the right directions, the impetus for taking forward the means for our survival as a species, which depends on sustaining the health and Wellbeing of the planet and people, has regrettably not yet been taken forward in health education generally, including veterinary and human medicine.

Despite the reality that most human illnesses in history are caused by zoonotic diseases and that of the 1,415 microbes that are known to infect humans, more than 70% come from animals,[26] few contemporary health curricula reflect causes, possible consequences, prevention and treatment. In addition, in many schools scant attention is given to environmental factors that may affect human and animal health through contamination, pollution and poor conditions that may lead to new infectious agents. Taken as a whole, it is becoming apparent and urgent that we need to go beyond teaching not only 'a relatively simple animal–human dyad, but also take the 'the roots of human Wellbeing (and ill health) in the dynamics of complex ecological systems much more seriously.[27]

According to the authors of 'Integrating a One Health Approach in Education to Address Global Health and Sustainability Challenges,[28,1] 'less than 3% of the total veterinary curriculum in the U.S. is devoted to public health issues, resulting in fewer than 2% of current veterinarians working in public health.' With regard to medical education, the authors also observe that, given the "anthropocentrism" of traditional medical curricula and medical education, 'medical training maintains a strict focus on human health.'

Moreover, at the time adopting a 'bottoms-up' change model approach, the post-graduate students from Duke University Oxford University, UNC Gillings School of Public Health, and North Carolina State University asserted that 'One Health educational programs could benefit significantly through Centers of One Health Excellence [COHE]), possibly with "seed" funding provided by a number of organizations (e.g., WHO, CDC, United States Agency for International Development [USAID], the UN's environmental program, foundations).[1] These could collaborate with national, regional, and global and educational institutions, government agencies, and public–private partnerships, develop blended curricula, advance multidisciplinary research, and inform 'plans that acknowledge the balance of the environment and health in achieving sustainable development.[28,1]

The World Veterinary Association (WVA) and the World Medical Association (WMA) 2nd global conference on One Health

A significant step in 'building capacity for a healthier world' was recently taken by the WVA-WMA in association with the Japan Veterinary Association and the Japan Medical Association at the 2nd Global Conference on One Health (GCOH) - Moving forward from *One Health* Concept to *One Health* Approach, held 10-11 November in Kitakyushu City, Fukuoka Prefecture in Japan.[29] With more than 600 participants from 44 countries, the conference focused on four main themes: Zoonotic and Foodborne Diseases, Antimicrobial Resistance, Environmental Hazards -exposure to humans and animals, and The Future of the One Health Concept. The resultant *Memorandum of Fukuoka* underscores the importance of *preventing* zoonotic diseases, collaboration and cooperation aimed at creating a system for zoonosis research and giving priority to support activities for developing and improving human and veterinary medical education, including applying the One Health concept and approach to One Health challenges along with the 'creation of a health and safe society.'

Creating the world we need through One Health education

In a post WVA-WMA conference summary document, Dr Chiang Johnson, WVA president-elect, emphasized the need for political action in progressing One Health policies, focusing on environmental health, and advocating the development of multidisciplinary One Health human and veterinary education and training programs, including continuing professional development (CPD). It may be noteworthy to mention that WVA-WMA support for additional resources for research in preventive strategies to enhance One Health parallels the recommendations of the post-graduate student authors arguing for Centers of One Health Excellence, discussed previously.[28,1]

Key resolutions reached at the WVA-WMA 2nd Global Conference on One Health (GCOH) underpin current One Health Commission (OHC)[19] in association with One Health Initiative[18] efforts, announced in a previous OHC-OHI Press Release,[30] to give the younger generation 'a better deal' for helping to shape a sustainable world. A basic assumption behind the Commission's funding proposal, summarized in a concept paper, 'Preparing Society to Create the World We Want through One Health Education,'[31] is that the best opportunity to achieve

meaningful societal change and prepare future leaders to create a healthier world must be seized early on in children's lives as they form fundamental views of their places on the planet and carry those views forward into adulthood.'

In a recent conference/webinar, *The World We Need*,[32] the One Health Education Task Force shared findings of a global One Health education survey and highlighted developments to date with regard to the proposed funding initiative supporting learning K-12+ learning opportunities that focus through team-building on the formation of:

- basic values and responsibilities with respect to "the community of life;"[31]
- knowledge with respect to the interconnectedness of life on our planet;
- real world application skills underpinned by interdisciplinary teamwork, creativity and group problem-solving; and
- a global network of One Health education providers who are committed to supporting learners and teachers in their quest to realize a more sustainable world.

A possible side-benefit of the One Health education initiative with a view to future generations and the creation of closer relationships with the natural world - especially 'in our technology-dependent age'- is that it may address a phenomenon, coined by American writer Richard Louv, as 'nature deficit disorder,' or 'a diminished ability to find meaning in the life that surrounds us.'[33] Reconnecting with the natural environment may raise awareness of 'how important nature is for children's development, affecting "everything from a positive effect on the attention span, to stress reduction, to cognitive development and their sense of wonder and connection to the earth…"

At more advanced post-secondary or higher education levels, for example, the early years of undergraduate human and veterinary medicine, recent articles such as 'One Health training, research, and outreach in North America,'[34] appearing in *Infection Ecology & Epidemiology* – the One Health Journal, and initiatives the proposed by the Planetary Health Alliance[35] should prove informative for those planning development opportunities. In terms of interdisciplinary education, more consideration might also be given to shared topics and cross- cutting problem-based learning activities that are high on the global SDG/One Health agenda,[1,10,36] including:

- Global health and Wellbeing challenges
- SDGs and the One Health concept and approach
- zoonotic diseases
- antibiotic resistance
- food safety and security
- ecosystem and environmental health
- land degradation and urban development
- agriculture and sustainability
- health impact of water

- energy usage
- biodiversity…

Concluding Comments

By means of a summary, in a chapter contributing to Jekel's *Epidemiology, Biostatistics, Preventive Medicine, and Public Health*[37] Dr. Meredith Barrett and Dr. Steven Osofsky compellingly affirm that 'Issues of global environmental change, global health, emerging disease, and sustainability present some of the most complex and far-reaching challenges of the 21st century.'

Furthermore, given the enormity of the universal transformation required in the decades ahead and along with a growing voice representing public health and related health professionals,[38] the authors stress that 'individual disciplines cannot address these issues in isolation.' The best way forward is to tackle 'the fundamental causes of global health and environmental threats.' For these researchers 'One Health offers a logical path forward by recognizing, not only the interconnected nature of human, animal, and ecosystem health but also by acknowledging the potential to fundamentally 'inform health and environmental policy, expand scientific knowledge, improve healthcare training and delivery, improve conservation outcomes, identify *upstream* solutions, and address sustainability challenges.'

As we continue to strive toward and recalibrating a new functioning and life-sustaining world order in this decade and beyond, can there be any doubt that the *One Health* concept needs to be recognized worldwide - sooner than later – as an indispensable 'idea whose time has come'?

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It is the long history of humankind that those who learned to collaborate and improvise most effectively have prevailed.
Cha*rles Darwin*

3.2 Study on academic One Health education in Japan (Tomiko Hokama, Ulrich Laaser)

3.2.1 Introduction

The "One Health" concept is well described in *One Health "at a glance"* (OIE n.d.): *it was introduced at the beginning of the 2000s. In a few words, it summarized an idea that had been known for more than a century that human health and animal health are interdependent and bound to the health of the ecosystems in which they exist. This concept is envisaged and implemented by the World Organization for Animal Health (OIE) as a collaborative global approach to understand risks for human and animal health (including both domestic animals and wildlife) and ecosystem health as a whole* (OIE, n.d.). The One Health concept has been well accepted in Japan as in the world. The One Health Approach also has been accepted - as a collaborative approach for One Health challenges. It was developed among many relevant organizations including civil society organizations and national Governments.

Physicians and veterinarians have provided practical services for human and animal health, respectively. The World Medical Association (WMA) and the World Veterinarian Association (WVA) signed an agreement on cooperation to improve global health in 2012. Following to the agreement between WMA and WVA, Japan Medical Association (JMA) and Japan Veterinary Medical Association (JVMA) signed a written agreement to share academic research information related to the development of human and veterinary medicine as well as to collaborate together to build a safe and healthy society in 2013.

The World Health Organization (WHO) also indicated *whole-of-society engagement including a One Health approach* in the Global Action Plan on Antimicrobial Resistance (AMR) that was adopted May 2015 by the World Health Assembly. Responding to the Global Action Plan, the Japanese Government set up an AMR task force under the Ministry of Health, Labor and Welfare (MHLW) in cooperation with other relevant ministries in November 2015 and released the "National Action Plan on AMR; from 2016 to 2020" in 2016 (Government of Japan 2016). Five out of six Goals of the National Action Plan are in line with the Strategic Objectives of the Global Action Plan of WHO. In both plans "Awareness and education" is included as Objective/Goal 1.

Following to the G7 Elmau Summit of 2015 in Germany, the Ise-Shima Summit was held in Japan in May 2016. Regarding to AMR the declaration of the Summit describes it as follows: *Building on the G7's previous commitment, we commit to make collective efforts for strengthening and actively implementing a multi-sectoral One Health Approach, taking into account the sectors including human and animal health, agriculture, food and the environment* (G7 Ise-Shima Leader's declaration 2016).

After JMA and JVMA have developed a cooperation system, Japan attended "the first WVA - WMA Global Conference on One Health (GCOH)" held in Madrid, Spain in 2015. Thereafter "the Second GCOH" was co-hosted by JWVA - WMA and JMA-JVMA in Fukuoka, Japan in mid-November 2016. The Fukuoka Declaration approved at the conference, declared the four

practical implementation steps of the One Health approach by cooperation of physicians and veterinarians. An academic education following the concept of One Health and its approach is part of the Declaration. Thus, in the year 2016, an epoch of One Health was started in Japan. Each country's National Action Plan on AMR can serve as a model to assess the One Health approach (Hannah and Baekkeskov 2020). In this manuscript, the One Health approach and academic One Health education in Japan is presented referring to the National Action Plan on AMR and the Fukuoka Declaration of 2016.

3.2.2 National Action Plan on Antimicrobial Resistance (AMR)

The National Action Plan on AMR was adopted at the Ministerial Council in April 2016 (MHLW 2016). The Action Plan consists of six goals with strategy and actions. Outcome Indices and Monitoring and Evaluation are also presented in the action plan. The six goals are as follows:

Goal 1. Improve awareness and understanding, and promote education and training of professionals

Goal 2. Continuously monitor antimicrobial resistance and use of antimicrobials, and appropriately understand the signs of change and spread of antimicrobial resistance

Goal 3. Prevent the spread of antimicrobial resistant organisms by implementing appropriate infection prevention and control

Goal 4. Promote appropriate use of anti-microbials in the fields of health care, livestock production and aquaculture

Goal 5. Promote research on antimicrobial resistance and foster research and development to secure the means to prevent, diagnose and treat the antimicrobial-resistant infections

Goal 6. Enhance global multidisciplinary countermeasures against antimicrobial resistance

In addition to Goals 1-5 which are in line with strategic objective of WHO, Goal 6 was added in the National Plan. The Japanese government has placed importance on cooperation with Asian countries. In 2016, The Tokyo Ministerial Meeting on Antimicrobial Resistance in Asia was cohosted by Japan and WHO. OIE Focal Point Seminars and Regional Training were carried out in several Asian countries. The number of countries participating in the relevant meetings is one of the evaluation indices; in addition there are two examples of subsequent progress of the Action Plan from the viewpoint of the One Health approach and cross-sectoral policy making.

1. Education and training on AMR

Goal 1 has two strategies. The second strategy includes undergraduate/graduate education on AMR: *Increase or enhance of contents on AMR, "Infection, Prevention and Control (IPC)", and "Antimicrobial Stewardship (AMS)" in school curricula and training guidelines, and promote educational activities in relevant organizations, as appropriate.*

Education related issues at school are under the jurisdiction of the "Ministry of Education, Culture, Sports, Science and Technology (MEXT)". Therefore, MEXT is expected to develop concrete strategies on curricula and training guidelines, as appropriate, based on the multi-sectoral one health approach in the future.

2. Integrated Surveillance

Goal 2 has five strategies. The fifth strategy: *Implement integrated One Health Surveillance including Humans, Animals, Food, and Environment.*

In January 2017, MHLW set up the Antimicrobial Resistance One Health Surveillance Committee. The Committee, consists of antimicrobial resistance experts from the area of humans, animals, agriculture, food and the environment. The collaboration of Japanese Veterinary Antimicrobial Resistance Monitoring System (JVARM) and Japan Nosocomial Infections Surveillance (NVAL) led to the establishment of a comprehensive One Health Surveillance system. The jurisdiction of JVARM and NVAL is with MAFF and MHLW, respectively. Integrated Health Surveillance has been reported as "Nippon AMR One Health Report (NAOR)" in 2017 2018 and 2019 by the Surveillance Committee. When we examine the One Health approach to AMR at the strategy level of the National Action Plan, *whether it has helped to generate response coalitions* (Hannah and Baekkeskov 2020), it is indicated that the inter-ministerial/cross-sectoral collaboration resulted in progress of One Health Surveillance.

3.2.3 Fukuoka Declaration and its implication

In the Second GCOH, WVA, WMA, JMA and JVMA agreed to move from the validation and recognition stage of the "One Health Concept" to the practical implementation stage. The Declaration showed the mission and attitude of physicians and veterinarians working in a wide range of employment fields toward "One World, One Health". The four practical implementation topics of the One Health approach are declared as follows (2nd WVA/WMA Global Conference on One Health 2016):

1. *Physicians and veterinarians shall promote the exchange of information aimed at preventing zoonotic diseases and strengthening cooperative relationships, as well as to undertake further collaboration and cooperation aimed at creating a system for zoonosis research.*
2. *Physicians and veterinarians shall strengthen their cooperative relationships to ensure the responsible use of important antimicrobials in human and animal healthcare.*
3. *Physicians and veterinarians shall support activities for developing and improving human and veterinary medical education, including understanding the One Health concept and approach to One Health challenges.*
4. *Physicians and veterinarians shall promote mutual exchange and strengthen their cooperative relationships in order to resolve all issues related to the creation of a healthy and safe society.*

According to the Fukuoka Declaration JVA and JMA have developed mutual communications on preventing zoonotic diseases and addressing food production and other related issues. Cooperative joint symposia on One Health have been carried out to provide necessary information for physicians and veterinarians. In addition to these direct cooperative activities, physicians and veterinarians promoted the cross-sectoral One Health approach in the National Action Plan on AMR through the National Task Force. The implementation of the topic 2 (zoonotic disease-control) and topic 3 (measures to deal with antimicrobials) has consequently developed in line with the concrete National Action Plan.

With regard to implementing topic 3, i.e. how physicians and veterinarians can support activities for developing and improving human and veterinary medical education including the One Health concept and meet One Health Challenges, we describe that in the next section.

3.2.4 One Health approach and cooperation system of physicians and veterinarians

Japan is an island country of East Asia consisting of One “To” (Tokyo), One “Do” (Hokkaido), two “Fu”(Osaka and Kyoto) and 43 prefectures. The population is 126,443,000 as of 2018 (MHLW, Handbook of Health and Welfare Statistics 2019). The numbers of physicians and veterinarians in 2018 were 327,210 (MHLW, JAPAN) and 39,710, respectively (MAFF, JAPAN). The main work places of physicians and veterinarians are public or private clinics and hospitals, municipal and national governments among others.

In order to develop cooperative systems of physicians and veterinarians at the municipal level, agreements on a cooperative relationship have been signed in regional/prefectural MA and VMA throughout Japan following to the agreement of JMA and JVMA.

Japan’s national and municipal government administration structure is vertical. The relevant ministries of physicians and veterinarians are MHLW and MAFF, respectively. The environmental issues are under the jurisdiction of the Ministry of the Environment (MOE). Furthermore, education including medical and veterinary educations is under the jurisdiction of the Ministry of Education, Culture, Sports, Science and technology (MEXT).

The One Health approach is especially successful with regard to civil society organizations’ due to their horizontal orientation. Therefore, the political decision makers expect that cooperative systems between physicians and veterinarians at national and municipal levels will function as well in order to promote the One Health approach. On the other hand, it is obviously difficult to develop horizontal structures in a National and Municipal Government that has a vertical administrative structure as shown in **Figure 3.2/1**. The National Action Plan was formulated by Committee consisting of experts of the relevant areas including medicine and veterinary medicine. These experts are expected to be able to remove walls - due to the vertical administrative structure - through their One Health advocacy directed at the policy making process. Thus, physicians and veterinarians are expected to support improving human and veterinary medical education. In the case of countermeasures against AMR, The Fukuoka Declaration is to be implemented by physicians and veterinarians in line with the concrete National Action Plan. Then, what are the current challenges for the One Health approach in the

National Action Plan on AMR? There are two issues to be considered: first, it is necessary to cooperate with MEXT and other relevant organizations to promote awareness and education; second, a focus on environmental health including more relevant academic institutions/associations is mandatory.

Figure 3.2/1: Vertical administration structure and One Health approach

3.2.5 Challenges in academic One Health education

The Japanese medical and veterinary medical education system has been improved under the jurisdiction of MEXT responding to social demands and the unification of international medical and veterinary education standards in a changing world of globalization. Both educational systems consist of a six-year undergraduate education that is quite different from the education systems of Europe and the United States. There are 82 schools for medical education (42 national universities, 8 public universities, 31 private universities and one Defense Medical School) and there are 16 faculties/schools for veterinary education (10 national universities, one public university and five private universities) in Japan. In addition to these universities, a new private university opened a Faculty of Veterinary Medicine in 2018.

With regard to medical education, the Bologna system in the medical curricula of most European countries is reported as successful (Bologna and Medical Degrees 2007). Patricio and Harden (2010) summarized the implication of the Bologna process in medical education: "*The Bologna Process-A global vision for the future of medical education*". After that the usefulness and efficacy of the Bologna Process/system in medical education has been reported e.g. by the University of Sarajevo (Masic et al. 2015, Masic et al. 2016). In Japan, MEXT revised its Model Core Curriculum in 2011 in order to educate physicians who can meet socially diverse demands. The essential practical competence (Attitudes, Knowledge and Skills) that must be acquired by graduation were clarified as objectives and learning goals in the revised version (MEXT, Model Core Curriculum for Medical Education in Japan 2016). After a six-year undergraduate education at a faculty of medicine, a two-year clinical training is mandatory according to the Physician's Act. The Model Core Curriculum was harmonized with the Bologna process summarized by Patricio and Harden. In 2016 a new organization, the Japan Accreditation Council for Medical Education (JACME), has been formed to ensure the international standard of medical education based on the World Federation of Medical Education (WFME) Global Standards for Quality Improvement.

Regarding veterinary medical education, OIE has developed a core curriculum on veterinary education based on the Third Global Conference of Veterinary Education during the period 2009-2013 (OIE 2013). Samad described in his review in line with the OIE statement: *It is necessary to think about standardization of the nomenclature of institutions, degrees, professional associations and core curricula, to contribute effectively to biomedical sciences and One Health at the national and global levels* (Samad 2017). In Japan, the Japan Science Council had recommended to MEXT in 2010 that veterinary education and research be provided at the Faculty of Veterinary Medicine as animal medicine with high academic and practical skills. Although the Model Core Curriculum was released already in 2011, it has to be improved responding to the OIE core curriculum and also to refer to the European Association of Establishments for Veterinary Education and to the American Veterinary Medical Association on such matters as e.g appropriate evaluation criteria. It is necessary to collaborate with Faculties of Veterinary Medicine and JVMA to promote academic and practical skills in response to the recommendation of 2017 by the Japan Science Council (Science Council of Japan, Recommendation 2017).

Hokkaido University is one of the national universities providing veterinary education at the Faculty of Veterinary Medicine. According to the course outline of “WISE Program for One Health Frontier of Graduate School of Excellence”, the program in Hokkaido has a “One Health Ally Course “ that is an inter-graduate school and inter-university special educational program to provide the essence of One Health for students in both humanities and sciences. The course has four modules: One Health seminar, One Health transferable skill training, One Health collaborative training and One Health site training. Table 1 shows one of the four modules *“One Health seminar 2020”*. A certification is awarded to those who have completed the course (Hokkaido University WISE Program/One Health Ally course).

Understanding of the One Health concept and its approach for One Health challenges is necessary for physicians and veterinarians and other relevant health personnel as well as social science personnel. The One Health Ally course of Hokkaido University is the excellent frontier of One Health education in Japan. As of now, curricula are developed in each university under the jurisdiction of MEXT, following the basic education Law. It is considered a great challenge how to develop the curricula including One Health education in medical schools and veterinary schools in the future.

Table 3.2/1 One Health Ally Course Syllabus-Module 1"One Health Seminar 2020" -Wise Program, Hokkaido University-

Goal/Objectives
1) To understand the concept of "One Health".
2) To acquire the mindset that is necessary for contributing to One Health approach from the learning of examples of One Health approach.

	Day	*Time*	*Topics*
1	*1*	*13:00-14:30*	*History of One Health*
2		*14:45-16:15*	*Zoobiquity, an emerging concept*
3	*2*	*13:00-14:30*	*Countermeasures for infectious diseases*
4		*14:45-16:15*	*Practical example of One Health approach, Control of brucellosis in African countries*
5	3	*8:45-10:15*	*Practical example of One Health approach, counter-measures for environmental pollution by mining industry*
6		*10:30-12:00*	*Practical example of One Health approach, Control of tuberculosis*
7	4	*13:00-14:30*	*Countermeasures for environmental health*
8		*14:45-16:15*	*Practical example of One Health approach, Activities of International administrative organization*

The Table is reproduced from the WISE Program/One Health Ally course" One Health Seminar 2020"
Available at: https://wise-oh-ally.vetmed.hokudai.ac.jp/syllabus/m1/post.html

3.2.6 Summary

JMA and JVMA have supported medical and veterinary education in postgraduate and continuing education. Both are professional associations consisting of highly expertized personnel. It is expected that a cooperative system of the mature academic associations/institutions will make it possible to introduce the One Health approach into the vertical administrative structure of the national and municipal governments. It is necessary for academic associations and civil society organizations as well, to support activities for improving human and veterinary medicine in order to foster a next generation which can work for achieving the UN-2030 Sustainable Development Goals and beyond.

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3.3 A code of ethical conduct for the public health profession

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Abstract

Objectives: Agreeing on a Code of Ethical Conduct is an essential step in the formation and definition of a public health profession in its own right. In this paper we attempt to identify a limited number of key ethical principles to be reflected as professional guidance.
Methods: We used a consensus building approach based on narrative review of pivotal literature and theoretical argumentation in search for corresponding terms and - in a second step - attempted to align them to a limited number of key values. The resulting draft code of ethical conduct was validated employing a framework of the Council of Europe and reviewed in two quasi Delphi rounds by members of a global think tank.
Results: The alignment exercise demonstrated the acceptability of five preselected key principles: solidarity, equity, efficiency, respect for autonomy, and justice whereas three additional principles were identified during the discussion rounds: common good, stewardship, and keeping promises.
Conclusions: In the context of emerging and re-emerging diseases as well as increase in lifestyle-related diseases, the proposed Code of Ethical Conduct may serve as a mirror which public health professionals will use to design and implement public health interventions. Future public health professional chambers should become responsible for the acknowledgement and enforcement of the Code.

Keywords
Code of ethics; principle based ethics; utilitarian ethics; moral obligations; professional standards; societal responsibility; public health profession; population ethics.

Introduction

The implementation of public health interventions raises ethical issues which require public health professionals to address them. The awareness of the ethical dimension of public health activities has given rise to the relevance of public health ethics, which Meagher and Lee refer to as "*a subspecialty of bioethics*" (1), and Kass refers to as a "*subfield of bioethics*" (2). Several authors have noted the importance of ethics for public health (3, 4), and public health professionals training (5). For example, ethical issues in public health also feature prominently in the efforts to control emerging infectious diseases at the population level (6, 7), which necessitated the World Health Organization (WHO) to issue guidance on how to deal with ethical issues in infectious diseases control (8). Also, the efforts to address antimicrobial resistance (AMR) have raised a number of ethical questions (9). In a systematic review by Klingler et al., they have identified a comprehensive catalogue of ethically relevant conditions (10). Thus in order to address the ethical issues arising from public health practice and research, it has been noted that there is a need to establish a Public Health Ethics Framework and a Code of Conduct for public health professionals, as well as to train public health professionals in population ethics (11). Several Frameworks for Public Health Ethics have been documented (2, 12-15); among them, Marckmann et al. (12) have provided detailed reasoning on application

in field practice. However, a gap remains: the development of a Code of Ethics and Professional Conduct in the field of Public Health or in short: a Code of Ethical Conduct for the public health profession.

In a recent introductory paper, Laaser and Schröder-Bäck (16) outlined the reasoning why a Code of Conduct is an essential step in the formation and definition of a public health profession in its own right at the national as well as the European level and with relevance to a global dimension. The European Directive on the recognition of professional qualifications 2005/36/EC (17) acknowledges as regulated professions in the health sector only physicians, nurses, dentists, midwifes, and pharmacists. The Amendment eight years later in Directive 2013/55/EU opens the door to include additional professions when it refers to a 'broader context of the European workforce for health' (18) which should then include for example veterinarians given their high relevance for people's health. In most of the European countries, public health professionals are not formally organized as an autonomous profession in its own right – as for example it is the case in the United Kingdom (19) – and do not adhere to an agreed Code of Conduct (20). However, the "Good Public Health Practice framework published 2016 by the UK Faculty of Public Health 2016 (21) constitutes rather – as the title says – a guide for ethical practice which may be derived from overarching principles as discussed in this paper. Although there are organizations of schools of public health (22) and public health associations (23) as well as other associations related to areas of public health relevance, agreement on a Code of Conduct as one precondition for the formalization and integration of a public health profession has not been promoted as necessary. The American Public Health Leadership Society (24) described the rationale for an ethical code of conduct in 2002 as: "…*a code of ethics thus serves as a goal to guide public health institutions and practitioners and as a standard to which they can be held accountable*". The statement goes further beyond public health professionals to include institutions that are involved in public health to abide to ethical conduct. However, as a first attempt this did not initiate a lasting debate and the recent volume of the Public Health Reviews on Ethics in Public Health (25) touches the topic only indirectly.

In the introductory paper referred to above (16), Laaser and Schröder-Bäck discussed the limitations of the often dominant utilitarian principle in population ethics. The utilitarian principle says that the moral worth of an action or inaction lies in the consequences that follow. An action (or inaction) is good if it maximizes the good for a maximum of people and is better in this regard than any alternative action. Intrinsic values – such as respecting persons or dignity – do not exist in utilitarian thinking. Instead of applying the utilitarian principle, the authors propose "...that solidarity and equity are core values that have to be reflected in a European version of a Code of Conduct for public health professionals… also guided by the principles of efficiency and respect for autonomy". As an additional principle they discuss justice, especially for resource sharing on a global scale. Although these five principles reflect the European heritage, the authors underline the increasingly global dimension of the public's health (26 27 28) and therefore of a public health profession well-defined by the same principles (29, 30).

Methods

We used a consensus building approach based on narrative review of literature and theoretical argumentation: we 1) argued the proposed five core ethical principles from the theoretical standpoint using a narrative review of selected publications in the field and trying to be as comprehensive as possible and relevant; 2) extracted and confirmed the five core principles as essential values for public health professionals and institutions in an "overlapping consensus" based on several rounds of discussion among authors, then translated the core principles into a draft Code of Ethical Conduct making use of 'mapping the terrain' as proposed by Childress et al. (31); 3) validated the draft employing the 'General framework for codes of conduct in the health sector' adopted by the Council of Europe in 2010 (32); and finally, 4) sent out the resulting draft for comments in two quasi Delphi rounds conducted by the Global Think Tank GHW-2030 (33). The comments from members of the Global Think Tank in round one have to a large degree been integrated by the authors. The second round revealed support in formulating the conclusions and recommendations and the approval of the second draft.

Results

1.0 Review of the literature with regard to corresponding terms

Table 1 presents the selected and scrutinized papers related to principles and norms regarding Public Health Ethics. We carefully aligned and synthesized theoretical frameworks to find the best fit between them.

2.0 The Draft Ethical Code

The identified literature revealed its best fit with the five core values identified earlier (16): solidarity, equity, efficiency, respect for autonomy and justice. Three additional principles were identified in the alignment exercise, which are: common (public) good, stewardship, and keeping promises and commitments. In the following we explain their core normative meaning.

2.1 Solidarity

Solidarity is a value that increases in significance in the health realm. Whereas in the conclusions of the Council of the European Union (38) solidarity was solely defined as being closely "linked to the financial arrangement of our national health systems and the need to ensure accessibility to all", the normative scope, its relevance and meaning for public health gets more and more developed during the last years. A recent report of the Nuffield Council on Bioethics defines solidarity as a concept that "signifies shared practices reflecting a collective commitment to carry 'costs' (financial, social, emotional or otherwise) to assist others." (41). Ter Meulen (42) emphasizes that solidarity is more than respecting each other and assuming liberal negative rights of freedom but that positive relations among human beings should be in the forefront, next to rights and duties. He formulates: "Health care policies and arrangements

should go beyond merely meeting needs and rights, by exploring how people's personal dignity and sense of belonging can be sustained within relations of recognition, reciprocity and support". From these essential cornerstones defining solidarity, one can conclude that the value of solidarity acknowledges that human beings should not forget that they are united, bond to other humans by virtue of humanity. From this also follows the duty for mutual support and the strengthening of relations among human beings should therefore be in the forefront of public health practice.

2.2 Equity

Also "equity" is one of the core values that are discussed in public health. The European Union defines equity in health simply as relating "to equal access according to need, regardless of ethnicity, gender, age, social status or ability to pay" (Council of the European Union 2006 (38)). However, equity is also the normative reminder that health inequalities have to be in the focus of all public health action if considered to be unjust and unfair (43), foremost all those which refer to religion, race, gender identity etc.

2.3 Efficiency

Despite the last values that focus on rights and stress the moral importance of every one, the value of "efficiency" stems from another philosophical school but the rights-based approach. "Efficiency" follows more utilitarian thinking inclined to maximize the positive outcome with a minimum of resources. This economic reasoning has a value - also from a moral perspective because it reminds public health professionals that one has to be careful when dealing with scarce resources. Scarce resources should be invested wisely to have the best health effect and economic evaluations are therefore important for public health. For instance, in some circumstances such as in the area of HIV/AIDS, there are challenging questions on how to allocate resources in an ethically acceptable and efficient way between preventive and curative demands (39) or between different health programs. Also, in the example of antimicrobial resistance, the allocation of resources may require reprioritization from other areas and sectors outside health in order to gather enough funding to support containment of the epidemic (9).

2.4 Respect for autonomy

Economic evaluation and utilitarian thinking have to be hold in check by the rights-reflecting values - equity, justice and also respect for autonomy. The normative core of the latter value is to re-iterate and focus what also is reflected in justice and equity: Every person has autonomy and thus the capacity to make own decisions (for children or other persons unable to consent, parents or guardians take this role). Respect for autonomy thus reminds public health professionals to obtain informed consent of persons who are subject to health interventions but also stresses that persons have a dignity that must not be comprised. This value warns of stigmatization and instrumentalization of persons for the benefit of others. If the autonomy of persons is comprised, this has at least the strong burden of proof that such an autonomy limiting behavior is justifiable. However, respecting the autonomy of everyone not only means "to back

off" and respect the liberty of a decision of persons. Rather, O'Neill (44) reminds the public health community that respecting autonomy can also refer to a duty, e.g. to participate in health interventions like immunization campaigns to achieve herd immunity. Littman and Viens (9) in this context have noted that in order to address antimicrobial resistance "citizens have obligations to educate themselves, obligation of not to infect others, and obligation to lobby for support from political leaders and industries."

There might be examples where the infringement of a will of a person can be justified. The use of spillover effects of an intervention as a basis to restrict autonomy of an individual has been well explained by Royo-Bordonada and Roman-Maestre (11, pp. 12 of 15): "…*among public health officials, there is a political component in the form of the health authority, with legal capacity in certain instances, to take action targeted at the individual or the environment. This capacity to restrict the autonomy of the individual can … come to be justified on the basis of the externalities, positive or negative, induced by the intervention in third parties".* An example could be to restrict the free movement of people with infectious diseases if their free movement could lead to severe infections of others.

Table 1: Review of ethical principles and terminologies with relevance to public health

Sources of Ethical Principles and Terminologies for Public Health	**Ethical Principles Proposed for Public Health**	**Attempted Alignment of Ethical Principles for Public Health Professionals**				
World Health Organization [2016] (8)	Justice Equity Transparency Inclusiveness/ Community engagement Accountability Oversight Utility Proportionality Efficiency Respect of persons (*autonomy, informed consent, privacy confidentiality*) Liberty Solidarity Reciprocity	Solidarity Reciprocity Community engagement	Equity	Utility Efficiency	Liberty Respect of persons (*Autonomy, informed consent, privacy confidentiality*) Proportionality	Justice Transparency Inclusiveness/ Community engagement Accountability Oversight
Core Ethical Principles		***Solidarity***	***Equity***	***Efficiency***	***Respect for Autonomy***	***Justice***

Littmann and Viens [2015] (9)	Justice Distributive fairness Effectiveness Reciprocity **Stewardship** Citizen obligations to self-educate Citizens obligations not to infect others Citizen involvement in lobbying Risk information sharing Distribution of research outcomes Public engagement Solidarity Reciprocity Health justice **Common good** Trust	Responsibility Citizen obligations and actions Solidarity Public engagement Reciprocity	Distributive fairness	Effectiveness Responsibility Priority setting and resource allocation	Risk information sharing	Justice Distributive fairness Health justice Trust Public engagement Distribution of research outcomes
Royo-Bordonada and Roman-Maestre [2015] (11)	Autonomy Solidarity Transparency Pluralism Community perspectives Rights of individuals **Common good** Partnerships (*public-private partnerships*) Collection and use of data (*information*)	Solidarity Partnerships (*public-private partnerships*)		Information (*collection and use of data*) Resource allocation	Autonomy Rights of individuals Pluralism	Community perspectives
Core Ethical Principles		***Solidarity***	***Equity***	***Efficiency***	***Respect for Autonomy***	***Justice***

Marckmann G et al. [2015] (12)	Maximizing health benefits Preventing harm Respecting autonomy Equity Efficiency Compensatory justice Transparency Consistency Justification Participation	Participation Justification	Equity Compensatory justice	Maximizing health benefits Efficiency	Respect for autonomy	Justice Participation Justification Transparency Consistency
Ortmann LE et al. [2016] (13)	Utility Equity Justice Reciprocity Solidarity Privacy Confidentiality **Keeping promises** Effectiveness Proportionality Necessity Least infringement Public justification	Solidarity Reciprocity Necessity	Equity	Effectiveness Utility	Privacy Least infringement Confidentiality Proportionality	Justice Public justification
Public Health Leadership Society [2002] (24)	Information Collaboration Respect for individual rights Diversity Incorporation Confidentiality	Collaboration		Information	Respect for individual rights, Confidentiality Diversity	Incorporation Information
Core Ethical Principles		***Solidarity***	***Equity***	***Efficiency***	***Respect for Autonomy***	***Justice***

Schröder-Bäck P et al. [2014] (34)	Maleficence Beneficence Health-maximization Efficiency Respect for autonomy Justice Proportionality	Justice	Justice	Efficiency Health-maximization	Respect for autonomy Proportionality	Justice
Laaser U et al. [2002] (35)	Solidarity Equity Efficiency Sustainability Participation Subsidiarity Reconciliation Evidence Empathy/Altruism	Solidarity Empathy/ Altruism	Equity Subsidiarity	Efficiency Sustainability Evidence	Reconciliation	Participation Sustainability
Institute for Global Ethics [n.d.] (36)	Competence Honesty Responsibility Respect Fairness Compassion	Compassion		Competence Responsibility	Respect Honesty	Fairness
Council of the European Union [2006](38)	Equity Universality Solidarity	Solidarity Universality	Equity			
World Health Organization [2015] (39)	Equity Solidarity Social justice Reciprocity Trust Individual liberty versus broader societal concerns **Public good** Distributive justice	Solidarity Reciprocity	Equity	Allocating scarce resources	Individual liberty versus broader societal concerns	Distributive justice Social justice Trust
Core Ethical Principles		***Solidarity***	***Equity***	***Efficiency***	***Respect for Autonomy***	***Justice***

Coughlin StS [2008] (40)	Minimizing possible harms treating others (*current & future generations*) fairly Sustainability Solidarity/social cohesion Precautionary principle Utility Public justification Least infringement Necessity Proportionality Efficiency Effectiveness Building and maintaining public trust Transparency (*speaking honestly and truthfully*) **Keeping promises and commitments** Protecting privacy and confidentiality Procedural justice (*participation of the public and the participation of affected parties*)	Solidarity/social cohesion Necessity		Effectiveness Efficiency Sustainability Utility	Least infringement Protecting privacy and confidentiality Proportionality	Treating others fairly (minimising possible harms) Procedural justice (*participation of the public and the participation of affected parties*) Building and maintaining public trust Transparency Public justification
Core Ethical Principles (summarized): *** Additional ethical principles remaining after the attempted alignment (bold in the table) are:** • Common (public) good • Stewardship • Keeping promises and commitments		**Solidarity** (reciprocity)	**Equity**	**Efficiency** (utility, effectiveness)	**Respect for Autonomy (**Respect for individual and community, privacy, confidentiality, least infringement)	**Justice** (public justification)

2.5 Justice

When can we consider something as being unjust and unfair? A benchmark for justice theories in health is the work of Norman Daniels. Daniels (2008 (45)) follows his teacher Rawls in the assumption that public institutions are obliged to promote fair equality of opportunity for everyone. Public institutions and resources should be organized in such a way that every person can participate in society – to take public offices but also to have resources to live a good life (which is not further specified). Daniels continues the Rawlsian approach by claiming that health significantly contributes to the opportunity range that people are having. And, as a consequence, justice requires to protect health and to meet health needs of every person. Following the philosopher Boorse (46), Daniels also has a clear idea of what health means in this context: species typical normal functioning according to the functioning of others in the same (e.g., age) reference class.

Thus, for public health professionals, justice understood in this way should remind them of including everyone to benefit from health and thus getting fair equality of opportunity in life when the social and other determinants of health (incl. access to health care) do not support this goal for everyone.

The concept of distributive fairness includes also the important question of how findings from scientific research are distributed since research evidence is key for an informed decision-making in public health. For instance, the tension in resource allocation between prevention and treatment in HIV and AIDS services can better be solved if decision makers know the evidence that treatment helps to minimize the risk of transmission, therefore, we can take treatment as part of prevention. In this way, the evidence for treatment as prevention can assist in distributive justice in resource allocation in HIV/AIDS between preventive and curative interventions. Also, by sharing research results, it will help communities to understand the value of interventions being implemented in public health and hence be more willing to support them. However, justice could also extend to include unproportioned focus on resource driven health programmes versus "other" public health calamities with significant impact. A key message to public health professionals is that distribution of research outcomes should be tailored to the audience, i.e., to the ordinary citizens; message should be prepared in simple, non-technical terms to ensure that it is clearly understood.

The core principle of justice and its emphasis on transparency, inclusiveness, and community engagement provides an opportunity for people of different culture, values, and beliefs to participate in assembling public support. "*Lessons from the Human Genome Project – Ethical, Legal, and Social Implications Program*" (1) indicate that engaging the public in an informed discussion aiming at reaching agreement on a particular public health intervention, can help to get support of the population or community.

2.6 Additional principles

From table 1, three additional principles have emerged, namely: protection of common (public) good; stewardship; and keeping promises and commitments.

2.6.1 Common (public) good

This principle focuses on the need to protect things that are shared by all for the benefit of all people in the community, population or a nation. In economic theories the characteristics of a "public good" are those of being "non-excludable" and "non-rivalrous". This means that all people can benefit from the good, no one is (or can be excluded), and use of the common good does not diminish the good. The "common (public) good" has close links to communitarian theories of public health ethics (47). This also requires public health professionals to be able to solve ethical conflicts between the protection of public good and human rights of individuals within a particular community or population (48). Knowing that priority is on preservation of common good should be the bottom-line for a Public Health Professional when implementing an intervention that encroaches on individual's rights and freedom. If a Public Health Professional decides to focus on rights of individuals alone at the expense of a common good, this may put the whole community or population at risk. Also, the principle requires the Public Health Professional to be informed by scientific evidence while making decisions about a particular intervention.

2.6.2 Stewardship

This normative value insists that public health professionals have a stewardship role, which means that they have to put the health of the population as their number one priority (37). In other words, the stewardship role of public health professionals makes them responsible for the health of the entire population. As stewards, public health professionals must have a vision for the health of the people they serve. This brings to them a need for using scientific information to analyse situation and design (jointly with the population) appropriate interventions. Also, public health professionals must build skills to engage the population and to reach consensus on public health interventions that will help to solve a problem at hand. If a Public Health Professional behaves as a "good steward", then all stakeholders will likely support the implementation of public health interventions. To this end, public health professionals must be able to communicate effectively all the interventions as well as research findings to the population. Laws, regulations, and other tools for governance arrangements are part and parcel of the stewardship role. Therefore, Public Health Professionals in fulfilling their stewardship role should be able to participate in setting regulations and bylaws and support the populations to comply with in order to flourish healthy lives.

2.6.3 Keeping promises

This principle calls for public health professionals to hold themselves responsible on the promises and commitments they make. It should be understood by the professionals that commitment to improve and preserve the health of the population they serve is central to their duties. When a planned intervention is to be implemented in a particular community, it is the responsibility of the Public Health Professional to ensure that the promise is achieved in a transparent manner and that the resources earmarked for the intervention are used as planned.

These three additional principles underline the relevance of operational ethical competence and are constitutive elements of public health professionalism.

3.0 Validating the draft Code of Conduct

For validation we found most suitable the general framework for codes of conduct in the health sector, approved by the Council of Europe in 2010 (32). In table 2 we attempt to show that the core ethical principles we identified can be aligned to a large degree with the framework adopted by the Council of Europe.

Table 2: General framework for codes of conduct in the health sector of the Council of Europe (complete version in the Annex).

Main areas	*Subareas*	*Selected examples*	Corresponding Core Principle
4. Areas to be regulated by a code of conduct in the health sector	*a. Good professional practice*	*i. Respect for the dignity of people (employees…)* *ii. Honesty and confidentiality* *…* *iv. Use of the best scientific evidence* *…* *vi. Compliance with regulations and legislation* *vii. Awareness of the needs, demands and expectations of the population* *…*	2.4 2.4 2.3 2.5 2.2
	b. Use of resources of the service/system	*i. Cost-effectiveness…* *ii. Avoiding using public resources for private gain* *iii. Prevention of fraud and corruption*	2.3 2.5 2.5
	c. Handling of conflict of interests…	*i. Economic: Weighing between health benefits and economic gains on one side and individual gains (employment, etc.) (45).* *ii. Non-economic: Managing relationships with health authorities and other government officials (11, 45).*	2.6.1
	d. Proper access, sharing and use of information	*…* *ii. Duty to disclose all relevant information…* *…*	2.4; 2.5
	e. Handling of gifts and benefits	*i. Existence of an explicit policy concerning gifts* *…*	2.5
	f. Research-related topics	*…* *ii. Truthful claims of research potential*	2.4

		… *iv.* Feedback to study populations on the results* *v.* Research outcomes as part of public good need to be shared in order to facilitate evidence-based decisions.*	2.4 2.5
	g. Relationships with other actors in the health sector	*…* *vii.* Collaboration between Public Health Professionals, Communities and Public Health Institutions.*	2.1 2.6.1
	h. Good corporate governance of health institutions/services/centres	*i. Issues of multiculturalism, tolerance and respect* *…* *ii.* Participation in humanitarian activities*	2.4 2.1 2.6.2
5. Enforcement of the code of conduct	*a. Recognition of violations* *b. Composition of the body responsible for dealing with enforcement* *c. Transparency of procedures and public scrutiny* *d. Complaints system* *e.* Use of nudging techniques in design of public health interventions (46). This emphasis is based on the consideration that public Health Professionals need to balance application of nudging and strict prohibition.*		2.5 2.5 2.5 2.5 2.3 2.6.2 2.5
6. Updating, monitoring and development of the code of conduct	*a. Process of development of codes of conducts: initiative, ownership, legitimacy* *b. Comprehensiveness* *c. Limitations of codes of conduct* *d. Codes of conduct and legislation*		2.6.1 2.6.2 2.6.3

* Amended by E. Eliakimu

4.0 Results of two quasi Delphi rounds

The final outcome of our integrating consensus oriented approach is summarised in table 3.

Table 3: The aligned Code of Ethical Conduct for the Public Health Profession

Preamble:	The public health profession is defined inter alia by an adopted set of principles guiding the ethical conduct of its members. These principles form a normative core of the profession. Public Health Professionals should orient their conduct – their doing and omission – according to the following norms and values. In case of conflict of these values, professionals accept a burden of proof to argue the ethically best acceptable solution for their conduct while taking the normative guidance of all these norms and values into account.
Core ethical principles	**Short characterisation taken from section 2.1-2.5 above**
2.1 Solidarity	Solidarity signifies shared practices reflecting a collective commitment to carry 'costs' together to assist others. Human beings are united in the fact that they are bond to other humans by virtue of humanity. From this also follows the duty for mutual support for every human being. The strengthening of relations among human beings should therefore be in the forefront of public health.
2.2 Equity	Equity is relating to equal access according to need, regardless of ethnicity, gender, age, social status or ability to pay. Health inequities considered to be unjust and unfair have to be in the focus of all public health actions.
2.3 Efficiency	Maximisation of the positive outcome with a minimum of resources, i.e., scarce resources should be invested wisely to have the best health effect.
2.4 Respect for autonomy	Economic evaluation and utilitarian thinking have to be hold in check by the rights-reflecting values - equity, justice and also respect for autonomy. Persons have a dignity that must not be comprised.
2.5 Justice	Public institutions and public health professionals are obliged to promote fair equality of opportunity for everyone. This principle also encompasses distributive justice on research, i.e. to consider how findings from scientific research are distributed.
Operational ethics	**Short characterisation taken from section 2.6.1 - 2.6.3 above**
2.6.1 Common (public) good	This principle focuses on the need to protect things that are shared by all for the benefit of all. Public health professionals must be able to solve ethical conflicts between the protection of public good and human rights of individuals. Knowing that

	priority is on preservation of common good should be the bottom-line for a Public Health Professional.
2.6.2 Stewardship	Stewardship makes public health professionals responsible for the health of the entire population. They have to build skills to engage the population and to reach consensus on public health interventions that will help to solve a problem at hand. They should also support the citizens to comply with various laws and regulations governing public health issues.
2.6.3 Keeping promises	This principle calls for public health professionals to hold themselves responsible for the promises and commitments they make. Promoting and preserving the health of the population they serve is central to their duties.

Discussion

The proposed Code of Ethical Conduct for the public health profession hopefully will become relevant in global and not just in European contexts. For example Anderson et al. (51) have highlighted a global health ethics in addressing the challenge of maternal and neonatal mortality. The identified principles make a significant contribution to the newer related field of "Global Health Ethics", which has been shown to adopt almost similar values but operates at or requires actions at global level (52). Principles include equity, justice, autonomy, human rights, application of scientific research, as well as related virtues such as compassion, trustworthiness, integrity, and conscientiousness. The World Health Organisation in its key document on Global Health Ethics has identified three ethical challenges that closely relate to these principles: first – "*… to specify the actions that wealthier countries should take, as a matter of global justice and solidarity, to promote global health equity*"; second – "*… is related to cultural relativity. It is sometimes asked whether ethical standards are universal, given that different people in different countries may hold different values or place different weights on common values*; third - *concerns international research, especially when investigators from wealthy countries conduct research in impoverished settings where participants are especially vulnerable or where language and cultural barriers make informed consent difficult."*(39, pp. 19-20) The implementation of the Code of Ethical Conduct for the Public Health Profession, supports public health professionals addressing the ethical questions and dilemmas for the benefit of population health. Ethical principles including equity, social justice, national and individual autonomy, transparency, accountability, open communication, trust, mutual respect, development of servant leadership are characterised as globally relevant to meet the global challenges. Also, solidarity, stewardship, production of global public goods, and management of externalities across countries, have been shown to be the "essential functions of the global health system" (53). The role of human rights in health links both, public and global health ethics. To this end supporting, protecting and respecting human rights is essential both to Public Health Ethics (54) and to Global Health Ethics (55). However, e.g. out of fifty-five finalized project proposals identified in the Second Public Health Programme (2008-2013) of the European Commission only 'equity' and 'efficiency' were explicitly considered in eighteen projects and four projects respectively while solidarity was only discussed in one project (56).

Limitations:

The limitations of our approach to public health or population ethics are obvious. Firstly, the selected literature may not be comprehensive respectively the balance between the relevance of publications and preferences of the authoring team may be biased by prejudice.

Secondly our attempt to align relevant terms in the literature (see table 1) may similarly be biased by our prejudices, although our intensive discussions during the last year hopefully have minimised the effect of personal preferences.

Thirdly, the terminology in the subject area has not finally matured leaving boundaries foggy and allow for undefined overlaps taking the example of public health vs. population health and global public health vs. global health where the latter terms include individual health predominantly subject of clinical medicine and the former terms are restricting to public health services and thereby to the multitude of public health professions working in the public health services (physicians, economists, sociologists to name a few). The authors of this paper however, do not consider public health ethics as a subspecialty (1) or a subfield (2) of bioethics. Although there are norms and values shared in bioethics and public health ethics, the latter has a basic normative orientation towards the good of the public and populations, whereas bioethics was designed for the clinical context of the patient-physician encounter (57).

Fourth, we embrace a public health ethics perspective but the purpose of this paper is to narrow it down to a Code of Ethical Conduct to guide multi-disciplinary public health professionals in their operations and to help defining a distinct profession targeting population health rather than individual health (16). This may imply the partly loss of a comprehensive picture, however, an elaborate guide or code would not serve the needs of the public health practitioner in the field. Insofar, we adopted a somewhat different strategy focussing on a smaller but comprehensive set of core principles (see table 3 above) relevant to public health ethics rather than prescribing a lengthy set of concrete rules (like e.g. 21 24).

Fifth, trying to be focused we did not elaborate on applications in the various fields of public health relevance as for example natural or man-made disasters and the resulting emergency state (58) which relates especially to the principle of solidarity, or the issue of universal health coverage (59) which requires the consideration of justice.

Sixth, the focus on populations leaves out personal conscience and self-determination values (60) or virtues (61, 62), most important being honesty and trustworthiness, integrity and excellence.

Finally, in light of the Sustainable Development Goals, SDGs (33) and the case for people and planetary sustainability becoming increasingly more urgent, it seems timely, although beyond the scope of this paper, to reflect on aligning the proposed ethical principles with the attainment of the SDGs, and for Public Health to adopt a wider perspective that underpins a One Health concept, that is, to encourage the collaborative efforts of multiple disciplines working locally,

nationally, and globally, to achieve the best health (and Wellbeing) for people, animals and our environment (63-66).

Conclusions and recommendations

The prospects of the Code of Ethical Conduct proposed here are related to its acknowledgement and enforcement which likely in the future can be done effectively only by own professional chambers or other suitable bodies for public health, not by common medical chambers as of now. The authors therefore urge public health professionals to use the proposed Code of Ethical Conduct with its eight principles to guide them in pursuing their work so as to assure that citizens are living healthy. Given the current context in which we experience emerging and re-emerging diseases, as well as the epidemic of lifestyle-related diseases; and also that research and public (health) institutions and their actors are threatened by populist politics and anti-factual movements (67), the proposed Code of Ethical Conduct should be used to guide the design and implementation of public health interventions including research, the training of public health professionals, their professional acting, and last not least the acknowledgement of a public health profession in its own right.

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Annex:

General framework for codes of conduct in the health sector of the Council of Europe (29)

1. Introduction
2. Values and ethical references
3. Legal framework of reference

4. Example of areas to be regulated by a code of conduct in the health sector
NB. Not all areas are applicable to all situations. The order of the items does not reflect priority ranking. The list is non-exhaustive and the items are for illustrative purposes only.
a. Good professional practice

i. Respect for the dignity of people (employees, patients, customers)
ii. Honesty and confidentiality
iii. Keeping up-to-date professional competence
iv. Use of the best scientific evidence
v. Compliance with accepted standards
vi. Compliance with regulations and legislation
vii. Awareness of the needs, demands and expectations of the population, patients and customers
viii. Co-operation with colleagues
ix. Spirit of moderation, reconciliation, tolerance and appeasement

b. Use of resources of the service/system
i. Cost-effectiveness practice in the use of resources
ii. Avoiding using public resources for private gain
iii. Prevention of fraud and corruption

c. Handling of conflict of interests in the best interest of patients and population, whether
i. Economic, or
ii. Non-economic

d. Proper access, sharing and use of information
i. Research of any information necessary for decision making
ii. Duty to disclose all relevant information to the public and authorities
iii. Duty to provide information to patients with respect to their needs and preferences

e. Handling of gifts and benefits
i. Existence of an explicit policy concerning gifts
ii. Transparency regarding gifts received from interested parties

f. Research-related topics
i. Clinical trials (Helsinki Declaration)
ii. Truthful claims of research potential
iii. Patient consent with full disclosure of risks

g. Relationships with other actors in the health sector
i. Colleagues and other health professionals
ii. Patients and their families
iii. Insurers, third-party payers
iv. Health-related industries (pharmaceutical, food, advertisement, cosmetic, medical devices, etc.), and other interest groups
v. Government officers of health and other sectors (police)
vi. Patients and self-help organisations, NGOs, etc.
vii. Media

h. Good corporate governance of health institutions/services/centres
i. Issues of multiculturalism, tolerance and respect

5. Enforcement of the code of conduct
a. Recognition of violations
b. Composition of the body responsible for dealing with enforcement
c. Transparency of procedures and public scrutiny
d. Complaints system

6. Updating, monitoring and development of the code of conduct
a. Process of development of codes of conducts: initiative, ownership, legitimacy
b. Comprehensiveness
c. Limitations of codes of conduct
d. Codes of conduct and legislation

4.0 An Approach to implementation

Whereas warning voices gets louder year by year the move from insight to action is difficult and often postponed. An attempt is made in the following two sections to outline structures and motivations which are to facilitate the step from knowledge-based understanding to effective action.

4.1 A guide towards One Health action (Richard Seifman)

Efforts to gain interest, traction, and resources for One Health will depend on a host of factors, initially the core characteristics of the region, country, or sub-national environment. It will depend on the target to be influenced and "Who" will be making the effort, whether an individual seeking to influence a legislator, university, or sectoral ministry, or a local or national non- governmental organization, or governmental or international entity. "What" is being sought will shape the nature of the actions; it will be different in pursuing a change in national policy, a course at a university, or a grant from a major bilateral, multilateral, or donor entity. Thus, many facets will determine how to translate good intentions into concrete One Health action. There is no simple formula but there are aspects which cut across all the above. This "guide" identifies the main elements to be considered 'en route' to success.

4.1.1 Operational Vision of One Health

Knowledge of what exists leads to consideration of which actions and domains require priority attention. The Building Block matrix in **Figure 4.1/1** below succinctly captures this idea and provides a modifiable operational structure for structuring activities.

Figure 4.1/1 One Health Building Blocks

Domain	**Stage**			
	Prevent	**Detect**	**Respond**	**Recover**
	Mapping of stakeholders, roles and responsibility			
	Financial and Personnel Resources			
	Communication and Information			
	Technical Infrastructure			
	Governance			

A starting point would be e.g. to assess existing key infectious disease control policies or capacity. These include:

- Capacity in surveillance, making use of international standards, tools, and monitoring processes.
- Capacity in human, animal, and environmental health—including communication strategies to prevent, detect, and respond to disease outbreaks.
- National emergency response capacity.
- Cross-sectoral collaboration and partnership.
- Control of known and other existing and potentially re-emerging infectious diseases.
- Efforts in relevant research and education.

4.1.2 Institutional arrangements at country level

In creating a One Health effort for a country, institutional and implementation arrangements will vary from country to country, and from desired actions and outcomes. 'Each will need to adapt arrangements to their specific situation based on risk profile, existing structures, related policies, past experience, and identification of human, animal, and environmental health factors. Most will be executed by at least two ministries (though ideally the three responsible for human and animal health and environment at a minimum), under an inter-ministerial framework for strategy, policy, advocacy, and project management. One ministry will likely be designated responsible for overall implementation and reporting. Each ministry will be given the responsibility to undertake specified activities in line with their formal portfolio functions, recognizing that such assignments

may be modified as a government reviews and revises how it delegates, budgets, and integrates new activities and local government authorities in the provision of services. While implemented directly through national arrangements, external arrangements may also help support project success'. [58]

a) National Arrangements

Different ministries within countries are responsible for different needs. Typically, these exist according to conventional disciplinary silos—environment, health, agriculture, social welfare, wildlife, and finance. It will require having an approach for linking these different ministries to address their shared needs. This is not new: 'there is precedent in ministerial cooperation for many important health-related issues: disasters, pollution, food supply, and many others. The challenge is not in identifying that there is a need, but in operationalizing shared ownership to drive added value. An additional challenge is improving understanding of how and why these health issues should be addressed collectively, given historical approaches'.

Internal working arrangements will be needed to put in place the One Health initiative, for it to take hold to ensure oversight, connections are fostered at an early stage, and promote sustainable coordination mechanisms as well as compliance. There may be existing collaborations to leverage toward this goal, and similarly, achievements in this realm may also benefit other internal programs; for example, as climate-relevant animal-human health work is inherently inter-sectoral and multi-regional, so it is important to establish a structure to maximize input, review and effective development. Countries will differ, but to effectively coordinate strategy, policy, and implementation undertaken by the public sector and by private actors engaged in human-animal-environment health and management, a high level Inter-Ministerial Committee (IMC) or its equivalent will be enormously useful in providing oversight of cross-sectoral technical and policy collaboration. It should have the active participation of the Ministry of Finance. Planning, Social Welfare, in addition to the health and agriculture/livestock ministries.

If such a national arrangement exists or is being considered, it should be broadened so that stakeholders and communities with specific interest are engaged and taken into account (this may be a critical area for various partners to join together in making the case). A national coordinating structure must also include active external participants such as Non-Governmental Organizations and technical assistance providers, United Nations and regional organizations, the private sector, institutes, and academic institutions. These may be major funders, technical experts and data/information, or service delivery providers. Further, this mechanism should be used for cross-evaluation of public health system needs for strengthening as well as disease-specific challenges in planning, monitoring, and communications.

[58] http://documents.worldbank.org/curated/en/961101524657708673/text/122980-REVISED-PUBLIC-World-Bank-One Health-Framework-2018.txt

Within ministries, projects aimed at operationalizing One Health will generally enhance: (i) capacity to provide leadership at national and subnational levels; (ii) capacity for the day-to-day administration of activities, such as determining human, infrastructure, and equipment resource needs and use, processing procurement activities, and administering withdrawal and disbursement procedures; (iii) reporting in their specified area of responsibility; (iv) monitoring and evaluating implementation activities, which include collection, analysis, reporting and dissemination of the data on inputs, outcomes, and impact from the various sources; and (v) strengthening the national and subnational levels monitoring system and evaluation based on identified gaps and weaknesses. A ministry will build on existing ministerial organizational relationships and assign tasks given present mandates determined by need. It is likely that key ministries will need existing structures strengthened with recruitment of additional staff and improved facilities. The same will be the case for local levels. Monitoring and evaluation of outcomes/results will be of great importance. Each engaged entity will likely have its own set of meaningful objectives, targets, benchmarks, and key performance indicators. Political and industrial commitment can be expected as a key factor in progress toward national One Health operations. Decision making power, resources, and mandates may be held by certain ministries, which must see the value of investing (whether financially, timewise, or via information flow) in coordination with other departments and ministries for sustained commitment.

b) External Partner Arrangements

The international community should - but not always - follow the government's lead and play a key but contributory role at the country level to guide national action plans that respond to endemic infectious disease outbreaks. It should help in meeting World Health Organization (WHO) International Health Regulations (IHR) and World Organization for Animal Health (OIE) Performance of Veterinary Services Pathway (PVS) standards and other commitments related to transboundary animal, human diseases or environmental health (e.g., climate, protection of ecosystems) aspects, and are aligned with international environmental agreements such as the Convention on Biological Diversity[59] or the Ramsar Convention on Wetlands[60]. These are core national public sector functions, and at the same time considered "global public goods"[61] that

[59] https://www.cbd.int/convention/

[60] https://www.ramsar.org/sites/default/files/documents/library/current_convention_text_e.pdf

[61] The main properties and distinguishing features of international public goods, including regional and global public goods can be grouped into two sets. The first is that their benefits have strong qualities of publicness – i.e., they are marked by nonrivalry in consumption and nonexcludability. These features place them in the general category of public goods. The second criterion is that their benefits are quasi universal in terms of countries (covering more than one group of countries), people (accruing to several, preferably all population groups), and generations (extending to both current and future generations, or at least meeting the needs of current generations without foreclosing development options for future generations). This property makes humanity as a whole the publicum, or beneficiary of global public goods. (Inge Kaul, Isabelle Grunberg, Marc A. Stern: Defining Global Public Goods. Available at: https://Oxfordscholarship.com. DOI: 10.1093/0195130529.003.0001).

require a combined national, regional, and global response, each of which can benefit from the engagement of the international community.

Of importance are the specialized intergovernmental agencies, which provide support to countries for the prevention, surveillance, and detection (including diagnostic laboratories) of diseases through normative standards and guidance, technical tools and training, advice on use of economic and costing analysis tools, and assistance with information technology tools and applications (among many others). OIE, WHO, and Food and Agriculture Organization (FAO) are the principal international agencies responsible for human and animal health, but there are many others that provide valuable information and assistance and should be drawn upon in the design and support. The OIE-FAO-WHO Tripartite Agreement[62] formalizes collaboration between the three agencies and recognizes their joint responsibility to address zoonotic and other high-impact disease risks and other health risks at the human-animal-ecosystem interface. Ongoing collaboration includes annual strategic meetings, joint engagement on technical topics, frequent communication on areas of common interest, and mechanisms to facilitate information sharing and assessment. The three institutions have different mandates and different levels of decentralization, affecting how activities are carried out. WHO is quite strongly decentralized with strong regional and country offices. National obligations under the IHR combined with WHO's strong country presence support early detection and response for emerging diseases and regional engagement. FAO is less decentralized, with several strong regional offices and many country offices. FAO regional and national staff also support national disease detection and response efforts, as well as providing capacity building in agriculture and animal production. OIE has a small workforce available at the regional and country levels, but a large network of experts, national focal points, collaborating centers, and laboratories, in line with their normative mandate. Environmental aspects are increasingly—but not routinely—considered in tripartite technical activities, for example consideration of wildlife migration patterns in evaluating zoonotic influenza risks. Routinely including technical expertise and experience from the environment sector would improve outcomes for many health concerns at the human-animal- environment interface. All these efforts would benefit from regular, sustainable funding and even stronger strategic coordination and leadership. In addition to technical agencies themselves, initiatives developed through the international community may help in implementation and/or mobilization of resources. With the COVID-19 pandemic, significant new financing has become available, providing new and rapidly changing pathways to cooperation and assistance which will offer opportunities for One Health actions.

[62] https://www.who.int/zoonoses/tripartite_oct2017.pdf?ua=1

4.1.3 Stakeholders

Stakeholder mapping[63] is an essential step in ensuring coordination with relevant parties and resources, and in identifying gaps and building synergies for a public health system to be prepared for pandemic and epidemic threats. There are varying approaches and levels of detail for stakeholder, network, and system mapping but the key common objective is that they provide an orientation to roles and responsibilities, as well as showcase the flow of decisions and their relevant resource flows (i.e., where money is held and how it is mobilized according to need, which may include a different sector). Existing public sector data or national coordination mechanism would indicate where there may be beneficial sharing of information and/or resources (such as expanding existing laboratory capacity to facilitate human and agricultural health partners to work together and maximize shared resources instead of developing separate facilities). The mapping may have utility for addressing specific priority diseases, informing risk assessment, as well as examining capacity and planning for hypothetical scenarios (e.g., as part of simulation exercises): Stakeholder analysis identifies groups or individuals that may impact or be impacted by a decision, bringing their perspectives and values to the table. It may help in assessing types of mechanisms in place (or lacking) for routine, ad hoc, and emergency communication and mandates. For example, stakeholder analysis informs communication strategy and messaging; communication goals for stakeholder engagement may differ based on level of hazard and emotion of affected stakeholders (e.g. times of crisis versus precautionary communication).

System mapping (i.e., describing a system, typically visually through a flow map, for a given disease, risk factor, or geographic unit) examines how components (including stakeholders) interact. It may also showcase areas of knowledge gaps, and/or inform critical control points to reduce risk. While operational emphasis is primarily placed on national or local levels, coordination with regional stakeholders is also relevant for One Health. In addition to transboundary disease prevention, detection, and control (via risk profiling), regional support can include resource access and sharing (e.g., laboratories, personnel training human resource strategy and action planning). While human, animal, and environmental health sectors are emphasized under One Health, many other sectors such as primary through professional education, also may be relevant at national levels for effective operations.

4.1.4 Methods and tools for operationalizing One Health

As indicated at the outset, the specific process for operationalizing One Health will depend on many factors (e.g., existing capacity, stakeholders already collaborating, infrastructure needs, particularly country-level priorities/context). However, some broad components are likely to

[63] To facilitate a modelling process one may consider hiring a professional company or expert groups/projects in the scientific environment

underpin the process at some point of operationalization. The following are among the key steps for making the One Health approach operational among countries and international agencies.

At the country level:

- Identifying in-country champions;
- Making the case for early identification and control of zoonotic diseases;
- Assessing the needs of the services;
- Joint priority setting and preparedness planning, including the identification of disease or risk hot spots;
- Establishing the appropriate enabling regulatory and political, institutional, and financial conditions, including their integration among human, animal, and environment sectors;
- Developing educational curricula, in particular at the university level, which integrate human, veterinary, and ecosystems health;
- Establishing the appropriate financial instruments.
- Last but not least, the general population has to be involved in an attractive way ("buy-in").

At the international agencies level:

- Creating increased awareness and making the case for One Health by preparing and disseminating economic analysis of disease impacts and enhancing advocacy mechanisms;
- Improving collaboration among international technical agencies, including regulatory and political, institutional and financial integration among human, animal, and environment sectors;
- Assessing local, regional, and global societal burdens and the cost-benefit and cost-effectiveness of intervention strategies;
- Identifying sustainable funding systems to support low income countries to cover the investment costs;
- Strengthening research capacity. In addition one has to identify what each receiving country has to offer in return.
- What are their assets, their beauty (e.g. in cultural terms), worth to save and to learn from.

4.1.5 Integration into planning

Every health, agriculture, or environment and natural resources program could, feasibly, consider options for integrating One Health strategies from the outset so that wider benefits can be realized. Disease prevention can be encouraged while also building public health system resilience for all hazards, consistent with the Prepare-Identify-Prevent-Detect-Respond-Recover spectrum or more focused Identify-Analyze-Prioritize-Manage (IAPM). For example, synergies could include joint surveillance for known and novel diseases to track progress in preventing and controlling endemic diseases while also gaining a baseline assessment of pathogens that could potentially spill over to humans in the future. There are three phases essential to integration of One Health aspects in any intervention. The first relates to establishing baseline data and

identifying areas of focus, and would relate to identification, appraisal, and approval phases. The second relates to engagement and planning for the areas of focus, and most closely correlates to the implementation. The third relates to monitoring and reporting progress, updating plans, and potential new areas of focus.

Within the first intervention phase, One Health approaches should consider a number of early assessment areas for public health systems strengthening, including the existing human, animal, and environmental health and management capacities and gaps and the opportunities for coordination among them. Additionally, it should seek to identify country-specific risk factors for known and emerging disease threats as well as opportunities for greater public health resource efficiency; costs and benefits of prevention, detection, response, and recovery investments and ongoing financing; risk mitigation; and broader outcomes (e.g., food and nutrition security, livelihoods, environmental protection, education, trade, and travel). Country capacity building tools whether single sector or multi-sectoral planning processes, provide relevant baseline and targeted capacity and gap assessments and can be used to identify synergies with existing country initiatives and donor programs.[64]

4.1.6 Indicators, monitoring and evaluation

Indicators to measure One Health operations—and recognition of their value—need to be established at country and international institution levels, reflecting inputs contributed and benefits conferred across multiple sectors. While each program may have its own specific objectives, and individual sectoral indicators for measuring specific public health program outcomes, a core set of One Health indicators on multi-sectoral effective coordination should be sought for consistency and comparison to better evaluate and further strengthen value-added applications of One Health. These should evaluate systems, coordination, planning, training to work together, and lastly, disease-specific targets that can help to crystallize discussions.

In general, these will involve indicators for: (i) national priorities, (ii) collaboration of systems, (iii) global objectives, into which One Health indicators can fit. A program may capture one or several types of indicators based on the scope of objectives. On a systems-wide level, indicators may be aggregated to assess overall effectiveness. Set forth below are a set of “core” One Health Indicators which can provide help in moving countries to action:
Illustrative Set of Core One Health Indicators:

[64] Explore also organizations within Africa - the Middle East and Asia that are organizations or ministries of health for their public and/or for Agriculture (plant and animal) agencies. Much of this data and these relationships already exists. One should address and begin to bond with relevant groups, agencies, leaders, etc. e.g. Deloitte, World Bank, European Investment Bank, Gates Foundation, and other highly philanthropic organizations such as several Interfaith banking institutions, based on their particular portfolio of clients as well as the global governance initiatives that they are undertaking.

Illustrative Set of Core One Health Indicators:

1. IHR annual self-assessments, Joint External Evaluation (JEE) and PVS assessments that are up to date
2. Progress made in establishing an active, functional regional One Health platform
3. Multi-hazard national public health emergency preparedness and response plan developed and implemented
4. Applied epidemiology training programs in place, such as Field Epidemiology Training Program (FETP) that jointly includes human disease epidemiologists and domestic and wildlife veterinarians
5. Disease-specific targets (for example, for COVID-19)

Underscoring all of the above, sustainability of cross-sectoral collaboration in public health systems will be a meaningful indicator itself, promoting permanence (embedded through professional culture and operational shifts) as opposed to ad hoc, short-term capacity improvements often seen during past outbreaks but not maintained as a foundation to address future threats.

Furthermore one needs to consider the religions and cultures of each country as well as their sanctions, embargos, tariffs and Internet criminals and hackers, drug lords etc., all of which will have consequences that have not yet been foreseen and likewise each country's current political and health care backdrop amid COVID-19 and Climate Change emergency management.

4.1.7 Putting it all together

Translating the many aspects of a One Health concept into action is a challenging task whether for a technical assistance or demonstration project, inclusion in an education module, or a multi-year program. Whatever the size or nature, it will require finding champions (for the public) and ambassadors (for contacting organizations) who can build support, garner buy-ins from key partners, funding, and a means to monitor results. These issues are true for an individual or a non-governmental organization, but more so for large bilateral institutions or multilateral development organizations, such as the World Bank. Regional coordination becomes even a more daunting task-- but can be done[65].

[65] https://www.wahooas.org/web-ooas-prod/sites/default/files/actualites/2093/final-communique-One Health-technical-meetinglome-togo.pdf

The World Bank's One Health Operational Framework[66], from which much of this segment is drawn, provides a comprehensive approach to moving from concept to application. To illustrate instances in which the One Health approach is featured, and the myriad of aspects that had to be dealt with, below are two World Bank African regional project appraisal documents.

The Africa Centers for Disease Control and Prevention[67] Regional Investment Project[68] covers all of Africa and builds on the African Union's establishment of the Africa CDC. With the regional coordinating center, Zambia for Southern Africa, identified as a One Health innovation effort. The fourth Regional Disease Surveillance Systems Enhancement Project[69] covers four countries and the Economic Community of Central African States and has significant discussion of animal and human health and One Health.

[66] worldbank.org/curated/en/703711517234402168/pdf/123023-REVISED-PUBLIC-World-Bank-One Health-Framework-2018.pdf

[67]https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen?mkt_tok=eyJpIjoiTW1VeE5qQmtPVGhtWkRReSIsInQiOiJGSE8xU2hNZm5FczgrM080aFZEcHdsQTgyaDVZcjZab1N3eDhGTlJaWURBRWFwdXRTMXVvXC9NV3RkSWZPQmhIU29uVitDem5XK0lHaGJjc1wvMnRNcStrWjd3WkphcVwvTjlQb0pYZCtIZk9IUXRtajJrQ2VVT0hDK3RwdnF2bit2dyJ9

[68] http://documents.worldbank.org/curated/en/550521576292519493/pdf/Africa-Union-Ethiopia-and-Zambia-Africa-Centres-for-Disease-Control-and-Prevention-Regional-Investment-Financing-Project.pdf

[69] http://documents.worldbank.org/curated/pt/487971570240865860/pdf/Africa-Fourth-Phase-of-Regional-Disease-Surveillance-Systems-Enhancement-REDISSE-Project.pdf

4.2 What can we do to improve One Health? (Ulrich Laaser)

Potential actions based on Continuing Environmental Education (CEE) are grouped in four sections adopted from Doug McKenzie-Mohr (2011) and amended by a foregoing section on personal behaviors underlining trustworthiness:

4.2.1) Identify the barriers to change unsustainable behaviors
4.2.2) Employ various commitment strategies
4.2.3) Produce and communicate effective messages
4.2.4) Enhance motivation and invite participation.

Personal behavior

The personal role-model is important if we want to convince others to change their current lifestyles. However, role-models are rarely perfect, thus we should admit difficulties we might have to realize them by ourselves. Therefore we should not teach others top-down, rather listen and advise. Furthermore it is essential not to overburden ourselves but to select a very small number of most relevant issues and plan action within the limits of our personal, social and material resources. Some individual lifestyle targets, e.g. for the majority of people living in the advanced Western World, may also apply to advanced Middle East or Asian countries in spite of a different cultural background but not likely to the majority of African countries and to the millions of people living in poverty.

4.2.1 Identify unsustainable behaviors and barriers to change; suggest innovative action

The following exemplary list comprises ACTION PROPOSALS and what is needed to promote them. Selected action proposals require extensive discussion and revision before being approached in reality.

I. Disposal of household garbage: initiate public action for cheap separation of paper, biodegradables, and plastic in connection with publicly financed re-utilization services.

NEEDED:
a) Provision of comprehensive operational Action-Plans by an expert group.
b) Initiation of Community Action and Focus Groups initiated by local advocates.
c) Promotion of a UN Initiative to rule out garbage transfer from North to South

II. Interdiction of plastic packing and bottling, instead promotion of re-usable paper, glass, and textiles.

NEEDED:
a) Discussion with the owners/managers of shops and especially supermarkets to find out about their options and willingness.

b) Actions in front of corporate parent companies by local advocates.

c) Discuss with representatives of the industry for plastic packaging and with decision-makers and try to initiate change at the legislative level (organize a long-term process); Address single use disposables, individually packaged, and the over packaging of products.

III. Argue for stepwise decrease of agricultural fertilizers and pesticides.

NEEDED:

a) Seek the discussion with farmers to understand their arguments.

b) Study the information already available and involve experts where necessary to understand the characteristics of fertilizers and pesticides, their production and use.

c) Balance the environmental protection effect with a possible increase of product prices for poor population segments and act accordingly at the industrial and political level.

IV. Argue for the elimination of diesel-motors from the market.

NEEDED:

a) Understand the industrial structures and sectors of need for diesel-motors.

b) Argue at the political level for a rise of taxes on diesel fuel above the level of benzene.

c) Promote electro-cars on the condition of an environmentally neutral discharge of their batteries.

V. Help define additional areas/parks of protected nature (animals and plants or e.g. Antarctica as a still largely 'unraped' continent).

NEEDED:

a) Long-term strategic action at the administrative (local and regional) level.

b) Secure sufficient funding (e.g. to buy land etc.)

c) Campaign the public over years.

VI. Organize a global, questionnaire, based survey of a convenient nationally defined sample of at least 25,000 participants.

NEEDED:

a) Establish a scientific lead group and sufficient infrastructure in terms of computer capacity, executive staff (2 volunteers) and funding (not essential for a smaller sample).

b) Develop a global campaign to attract high participation rates.

c) Publication in scientific journals, social media, and presentation of results to target groups.

VII. Identify and support stable frameworks of governance to carry forward innovative action identified.

NEEDED:

a) Establish a network of credible, ethical, social influencers.
b) Agree on OH priorities and a realistic assessment of the chances to realize them in terms of adopted legislation.
c) Develop essential legislative proposals and advance them globally, a team of lawyers and OH experts has to cooperate to secure success.
….

4.2.2 Understand various commitment strategies

In order to advance the ACTION PROPOSALS the following support structures or action strategies are conditional and have to be developed in detail.

I. Initiate/support/organize local action groups e.g. Focus Groups with government officials, etc. (ministers, ministry employees, government agency employees, policy and law makers, policy advocates, lobbyists, advisers etc.).

NEEDED:

Easy instruction-guidelines for Focus Groups (digital and face to face) and advocates at all three levels (global, national, and local) linked to the One Health organization. In order to easily draw experts explore already ongoing forums/symposiums/world events.

II. Connect and integrate regional and local One Health organizations and develop a support and finance plan for regional and local OH organizations, especially also for 1HOPE-GPA.

NEEDED:

A fundraising team supervised by the Commission working on the basis of agreed rules (e.g. white list of industries)

III. Organize a unified, global OH organization with a coordinating center/secretariat in a central location e.g. Brussels, Geneva, Istanbul.

NEEDED:

Funding about 150,000 USD.

IV. Plan and organize a One Health WORLD ASSEMBLY (digital?) with at least 500 attendees, an action-oriented program and well prepared media-work, followed by regional/local meetings.

NEEDED:

A lead-organization and at least 10 participating and supporting organizations; secure a funding of at least 100,000 USD.

4.2.3 Communicate effective messages

ACTION PROPOSALS as suggested under 4.2.1 have to be communicated by the ORGANIZATIONAL STRUCTURES proposed in 4.2.2 through all available media.

I. Develop promotional material for local action groups and an open-access web-platform for publishing promotional and educational materials.

NEEDED:

At least 2 facilitators, one of them with qualification in designing material, one with extensive digital expertise.

II. Prepare radio- and TV-based thematic discussion groups for Netflix, You Tube etc.

NEEDED:

Experts for at least 3 different aspects of environmental protection, a chair person, and a technical expert for the organizational and technical arrangements especially the recording of the sessions.

4.2.4 Enhance motivation and invite participation

Employ systemic leadership as a means to introduce systems thinking into the realm of health governance and policy: identify criteria-based agents of change (at the community as well as the government level) and organize the interaction of sections 1-3. Secure the overall framework of the SDGs (UN n.d.) and TWI2050 e.g. under the guidance of the One Health Commission.

References

McKenzie-Mohr, Doug: Fostering Sustainable Behavior, an Introduction to Community-Based Social Marketing (Third Edition). Amazon 2011.

UN (n.d.). SDG Annual Progress Reports: https://sustainabledevelopment.un.org/?menu=1300

5.0 Guidance for Organisers and Lecturers (Ulrich Laaser)

This module targets the Global One Health Environment. A modern learning module (formerly 'teaching' module) like this attempts to be well structured and yearly updated to integrate the latest developments in science. Lectures should account for not more than 50% of the total learning time (excluding homework). Lectures should be interactive wherever possible and alternate with interactive small group discussions, role play, case studies, documentaries, international field practice, literature review, critical reading, and presentations by scholars.

5.1 Structure and content

This learning module may be structured according to the European Credit Transfer System (ECTS), corresponding per ECTS to 25-30 hours student workload (thereof up to 15 contact hours of lecturing and supporting the scholar's work process) (see Table 5.1/1).

'As part of an academic degree program, the module may be worked into a Masters Curriculum in Global Health with corresponding admission and course completion requirements. Equally the module may also be incorporated into a DrPH (Doctoral program in Public Health) curriculum in which course specifics remain constant but where perspectives are broadened through increased emphasis on relevant readings and calls for ground breaking, context-specific case studies. A third option is the organisation of the delivery as a course for Continuing Education (CE)'. Note: Entrance requirements are to be determined by the institution offering the module.

5.2 Organisation

The implementation of the Learning Module can be organized e.g. according to the following scheme as 5 daily Learning Courses or 1 week, corresponding to 5 times 6 hours at 45 minutes, together 30 hours equaling 1 ECTS.

Date: Day 1 (example)
Lecturing: 3 contact hours (at 45 minutes); exercises: 3 hours (at 45 minutes)
Coordinator of Course 1: contact details
Lecturers of Course 1: contact details
Place: full address including telephone and email.
Time: 09:00 – 16:00 (lunch break 12:00 – 13:00)

Table 5.1/1: Possible structure of the Learning Module at days 1-5

Timing	Program	Topics
09:00 - 09:45	Lecture	1.1 Introduction to the course, expectations of scholars 1.2 Development and principles of the One Health and the Health Sciences 1.3 Expected achievements of One Health
10:00 - 10:45	Interactive lecture	2.1 Principles of the assessment of the status of climate and biodiversity 2.2 Essential One Health functions 2.3 One Health competencies
10:45 - 11:15	Coffee break	
11:15 - 12:00	Exercise 1	Small group work on self-selected topics
12.00 - 13:00	Lunch	
13:00 - 13:45	Exercise 2	Individual or team based preparation of presentations
14:00 - 14:45	Interactive lecture	3.1 Regional challenges of One Health 3.2 Population based ethics and essential One Health legislation 3.3 The Sustainable Development Goals (SDG) and Universal Health Coverage (UHC)
14:45 - 15:15	Coffee break	
15:15 - 16:00	Exercise 3	Presentations by scholars

5.3 Learning methods

A learning course comprises e.g. six hours under supervision, 3 hours of interactive lecturing (with a variety of questions, interactions, visual aids, and instructional materials), and 3 hours of exercise sessions (team work e.g. in describing environmental health challenges). Instructors will explain procedures, demonstrate tasks and observe and interact with participants providing ongoing feedback. The program can be digitalised for distance learning.

5.4 Expected outcomes and competencies

Understand the concepts of limits of growth theory, and models of modified and enriched DPSEA (Driving Force–Pressure–State–Exposure–Effect–Action) as well as Climate Change adaptation tools in regard to different social and health determinants and challenges. Acquisition of knowledge and skills needed to be part of high level management to implement and evaluate environmental, health and Wellbeing aspects of policies and strategies.

Applying a national and regional approach in climate change vulnerability, impact assessments and adaptation measures – take note of the role of the health sector in inter-sectorial actions.

Students and public health professionals after completing this module should demonstrate an improved understanding of the human rights, nature, context, root causes and risk factors, burden, and consequences of the structural and social violence and armed conflicts; be familiar with the use of the ecological model and the public health approach; and to be able to identify the multilevel evidence-based programs and structural interventions for violence prevention.

Specific outcomes and competencies:

1. define governance and governance for health and Wellbeing;
2. position public health governance within a health policy framework;
3. optimize policy-making in the 21st century;
4. identify limitations of addressing health and Wellbeing issues in early decades of the 21st century;
5. define good/inclusive governance and apply World Bank governance indicators;
6. consider the impact of major UN agreements reached in 2015 on governance at global and national levels;
7. articulate rationales for developing a new world view and identify key future governance policy criteria;
8. synthesize the essence of the ‘One World, One Health’ concept and describe strategies required to strengthen its role in policy and practice;
9. evaluate the need for a new form of world governance and its potential role in safeguarding the planet and people.
10. to raise awareness about the role of governance in strengthening health systems and public health and its overall contribution to policy development in progressing three major UN agreements reached in 2015.
11. to consider the adoption of a new mindset in meeting global challenges to planet health and Wellbeing, applying, where appropriate and feasible, the ‘One World, One Health’ concept.

12. to examine the need for a new form of global governance that is 'fit for the 21st century' and is able to effectively respond to unprecedented environmental, societal, economic and geopolitical hurdles and lead the way to a safer, fairer and equitable future for all.
13. understand the concepts of limits of growth theory, and models of modified and enriched DPSEAA and Climate Change adaptation tools in regard to different social and health determinants and challenges Acquisition of knowledge and skills needed to be part of high level management to implement and evaluate environmental, health and Wellbeing aspects of policies and strategies.
14. applying a national and regional approach in climate change vulnerability, impact assessments and adaptation measures - the role of the health sector in the inter-sectorial actions.

5.5 Target groups

Those who pursue a career in environment and public health management, policy development, research or advocacy at the local, national or international level, i.e. teaching and/or research careers in academic environments, policy makers and advisers, private, industry and Non-Governmental Organizations, freelance consulting

5.6 Documentation

Open Access Resources: The following books are available online in the South Eastern European Journal of Public Health:

a) European Stability Pact for South Eastern Europe

PUBLIC HEALTH TEACHING BOOKS (1st edition)

- Health Systems and Their Evidence Based Development (578 pages)
- Management in Health Care Practice (672 pages)
- Health Promotion and Disease Prevention (806 pages)
- Health Determinants in the Scope of New Public Health (633 pages)
- Public Health Strategies: A Tool for Regional Development (647 pages)
- Methods and Tools in Public Health (1014 pages)

Available at:
DOI: https://doi.org/10.4119/seejph-1910 and
URL: https://www.seejph.com/index.php/seejph/article/view/1910

PUBLIC HEALTH TEACHING BOOKS (2nd shortened edition)

- **Burazeri, G. and Kragelj, L. Z.** (2017) "Health: Systems – Lifestyle – Policies; Forum for Public Health in Southeastern Europe Vol I", *South Eastern European Journal of*

Public Health (SEEJPH). Available at: https://doi.org/10.4119/seejph-1919 and https://www.seejph.com/index.php/seejph/article/view/1919

- **Burazeri, G. and Kragelj, L. Z.** (2017) "Health Investigation: Analysis – Planning – Evaluation; Forum for Public Health in Southeastern Europe Vol II", *South Eastern European Journal of Public Health (SEEJPH)*. Available at: https://doi.org/10.4119/seejph-1920 and https://www.seejph.com/index.php/seejph/article/view/1920

b) The global public health curriculum

Laaser, U. and Beluli, F. (2016) "Special Volume 2016, A Global Public Health Curriculum (2nd Edition)", *South Eastern European Journal of Public Health (SEEJPH)*.
DOI: https://doi.org/10.4119/seejph-1828
URL: https://www.seejph.com/index.php/seejph/article/view/1828

6.0 Short Curricula Vitae of Contributors

a) Yehia Abed

Professor Dr. Yehia Abed (MBBCh, MPH, DrPH) –Professor of Public Health -Al-Quds University.

Dr. Yehia Abed is a public health physician, graduated from Johns Hopkins University with 49 years' experience in senior public health positions in Palestine, primarily with the Ministry of health as Director of Public Health then Director General for Research Planning and Development. Dr. Abed joined Al-Quds University (1997) as founder Dean of the Faculty of Public Health. Through more than 110 publications, Abed focused primarily on research and programs addressing women and children's public health issues in Gaza, including immunization, growth, nutrition, Gender issues, MCH services and Epidemiology of communicable and non-communicable diseases. Abed participated in teaching at Al-Quds University and number of institutions including Faculty of Medicine and Faculty of Pharmacy – Nutrition programs. Thesis supervision included 118 of Master and PHD students.
https://www.researchgate.net/profile/Yehia_Abed/publications

b) Madhumita Dobe

Dr. Madhumita Dobe MBBS, DCH, MD, MCH, is currently working **as Director - Professor (Public Health), Department of Health Promotion & Education** All India Institute of Hygiene & Public Health, Kolkata (Ministry of Health & Family Welfare, Government of India)
She has an excellent academic record with several scholarships and gold medal awards.

She is presently involved in teaching and research activities for post graduate training programs conducted at AIIHPH, ICMR (Indian Council of Medical Research) , and various other national and international organizations.
Her special interest lies in Health Promotion and Education. Behavioral Epidemiology, SBCC,IEC, Health Communication, Maternal & Child Health, Nutrition – with special focus on Infant and young child feeding and Qualitative research.

She has published more than 100 papers in National & International journals
She has been the Principal investigator in several multicentric research projects
She Guides almost 10 dissertation and theses annually
She has over 100 publications in peer reviewed bio-medical journals and books

She has delivered over 500 invited lectures/editorials in scientific meetings/journals.
She has participated as public health expert in National Emergency response teams for Bird flu and Covid 19 pandemics.

Additional activities:
Member Governing Council of the World Federation of Public Health Associations (2009-15)
Organizing Secretary 14th World Public Health Congress 2015
Reviewer/Referee for: Journal of Indian Medical Association, Applied Nutrition and Indian Journal of Public Health
Member, Editorial Board, SEEJPH and Journal of Public Health Policy
Past Managing Editor of Indian Journal of Public Health-an official organ of Indian Public Health Association
Member of the International Expert Group in Health Promotion at WHO HQ Geneva (2009 – 2012)

c) Eliudi Eliakimu

Biography of Dr. Eliudi S. Eliakimu (MD, MPH) as of 06th February 2021

Title: Director of Health Quality Assurance in the Ministry of Health, Tanzania Community Development, Gender, Elderly and Children (MoHCDGEC)

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I am a Tanzanian Medical Doctor. I obtained my Doctor of Medicine (MD) Degree from the University of Dar es Salaam – Muhimbili University of Health and Allied Sciences in 1999 (1994 to 1999) and Master of Public Health at Muhimbili University of Health and Allied Sciences in 2010 (October 2009 to September 2010). Currently, I am working as Director of Health Quality Assurance at the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) Tanzania Mainland since January 2020. Between March 2019 and January 2020, I worked as Acting Director of Health Quality Assurance. Before that, I worked as Assistant Director of Health Services Inspectorate and Quality Assurance in the Health Quality Assurance Division from 15th December 2014 to March 2019. I also acted in the same position since November 2013 to December 2014. Also, I have held several professional positions under Health Services Inspectorate Unit which by then was under the Office of Chief Medical Officer between 2005 and 2013 and I also saved as Program Officer for Infection Prevention and Control-Injection Safety Programme (funded by the US CDC-PEPFAR) from January 2005 to August 2009. Previously, I worked as: Academic Officer and Vice Principal at Bugando Assistant Medical Officers' (AMO) Training Center in Bugando, Mwanza from July 2002 to December 2004; Registrar in Surgical Department at Bugando Medical Centre (BMC) and Tutor at AMO Training Centre, from 2002 to 2004; Registrar in Paediatric Department of BMC and Tutor at AMO Training Centre from February to December 2001. I did my Internship programme from September 1999 to November 2000 at BMC.

I have published (co-authored) 11 articles in several journals as follows: **(1)** Assessment of health facility quality improvements, United Republic of Tanzania. *Bulletin of the World Health Organization* 2020;98(12):849-858A. DOI: https://dx.doi.org/10.2471/BLT.20.258145 **(2)** Status of Infection Prevention and Control in Tanzanian Primary Health Care Facilities: Learning from Star Rating Assessment. *Infection Prevention in Practice 2*020; 2(3):1000712 https://doi.org/10.1016/j.infpip.2020.100071 **(3)** Determinants of Pregnant Mothers to Bypass Primary Health Facilities and Directly Seek Health Care in Hospitals in Dar es Salaam Region-A Cross Sectional Study. *J Epidemiol Public Health Rev*. 2020; 5(1): dx.doi.org/10.16966/2471-8211.181 https://www.sciforschenonline.org/journals/epidemiology-public-health/article-data/JEPHR181/JEPHR181.pdf **(4)** National Commissioners on High Quality Health Systems. National Commissions on High Quality Health Systems: activities, challenges, and future directions. *Lancet Glob Health* 2019; 7(2): e179–80.

DOI: https://doi.org/10.1016/S2214-109X(18)30528-X **(5)** Basic Accountability to Stop Ill-Treatment (BASI); Study Protocol for a Cluster Randomized Controlled Trial in Rural Tanzania. *Front. Public Health 2*018; 6:273. doi: 10.3389/fpubh.2018.00273 **(6)** A code of ethical conduct for the public health profession", *South Eastern European Journal of Public Health (SEEJPH),*2017, Vol. IX. DOI: 10.4119/seejph-1863. https://doi.org/10.4119/seejph-1863 **(7)**Antimicrobial stewardship in Tanzania: A consideration of strengths, weaknesses, opportunities and challenges for maintenance and further development of efforts. *International Journal of Health Governance 2*016; 21(3):150-164. https://doi.org/10.1108/IJHG-02-2016-0012 **(8)** The "5S" approach to improve a working environment can reduce waiting time: Findings from hospitals in Northern Tanzania. *TQM Journal*, June 2016; 28(4):664-680. https://doi.org/10.1108/TQM-11-2014-0099 **(9)** Creating a national culture of quality: the Tanzania experience. *AIDS* 2015; 29(Suppl 2): S175-S177. doi: 10.1097/QAD.0000000000000714. https://doi.org/10.1097/qad.0000000000000714 **(10)** Factors influencing national rollout of quality improvement approaches to public hospitals in Tanzania. *Clinical Governance: An International Journal 2014*; 19(2):137-152. https://doi.org/10.1108/CGIJ-09-2013-0033 **(11)** The Status of Occupational Safety among health service providers in hospitals in Tanzania. *Tanzania Journal of Health Research* 2008; 10(3):159-165. http://dx.doi.org/10.4314/thrb.v10i3.14356

I have been a reviewer in several journals including the *Gates Open Res* 2018: https://gatesopenresearch.org/articles/2-27/v1#referee-response-26534

and https://gatesopenresearch.org/articles/2-4/v1#referee-response-26231

and the *Bull World Health Organ* 2020;99:72–74| DOI: http://dx.doi.org/10.2471/BLT.21.970121

d) Rusmir Goletic

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EXPERIENCE:

Expert Associate for Veterinary Public Health and Ecology (2018 – present), Institute for Health and Food Safety Zenica (Bosnia and Herzegovina), Department: Veterinary Institute.

Environmental advisor – consultant (2014–2018), OIKOS Zenica, Zenica (Bosnia and Herzegovina) – owner.

Higher education teaching professional (2011–2013), High school: "Mješovita srednja škola Zenica", Zenica (Bosnia and Herzegovina)

Quality Control Manager (2009–2011), Zenička industrija mlijeka "ZIM" d.d. Zenica, Zenica (Bosnia and Herzegovina), Sector: raw milk control service; Sector: physico-chemical laboratory and microbiology laboratory; Sector: Quality Control

AFFILIATIONS:

Member of the working group (2019–Present), One Health for One Planet Education (1HOPE) Initiative

Mentor (2018 – present), International Student One Health Alliance (ISOHA)

EDUCATION: Doctor of Veterinary Medicine (2009) - Veterinary Faculty, University of Sarajevo, Sarajevo Bosnia and Herzegovina

e) Tomiko Hokama

Tomiko Hokama、MD, Ph.D.(Med), MSc

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Tomiko Hokama is Emeritus Professor for Child Health, University of the Ryukyus, Okinawa, Japan.

She graduated from Okayama University School of Medicine in 1972. After medical training at Okayama University Hospital, she had been at full-time pediatrician at Ryukyu University Hospital until 1980. She obtained degree of PhD (Med) from Kagoshima University, and MSc in Infectious Diseases from London University Hygiene and Tropical Medicine. She is certified as Pediatrician and Specialist from Japan Pediatric Society. She worked at the University of the Ryukyus for 43 years. During that time, she had an assignment of Dean of the Graduate School of Health Sciences (2004-2010) and Executive Vice President (2013-2017), and also worked as Executive Board Member (President 2009-2011) at Asia-Pacific Academic Consortium for Public Health. Her main research and teaching interest are child health and global health and has published child health nutrition related papers.

f) Ulrich Laaser

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Born 1941 in Königswusterhausen near Berlin. Head (since 1998), Section of International Public Health at the Faculty of Health Sciences, School of Public Health, University of Bielefeld. Principal investigator of the Stability Pact Project on Public Health Training and Research in South Eastern Europe (2000-2010). Visiting professor at the School of Public Health in Belgrade, honorary professor in Sofia and Tirana. Member of the executive boards of the World Federation of Public Health Associations (WFPHA, president 2010-2012), of the Association of Schools of Public Health in the European Region (ASPHER, president 1993-1995), and of the German Association for Health Sciences and Public Health (president 1997-2001). Member of the Honours Committee of ASPHER and chair of the Advisory Board of the WFPHA (since 2015). Co-editor of the book series on International Public Health, Hans Jacobs Editing Company, Lage, Germany; co-editor of the South Eastern European Journal of Public Health (www.seejph.com). Degrees 1970 from the Johns Hopkins Bloomberg School of Public Health, Baltimore, USA (Master of Public Health) and 1969 from the London School of Hygiene and Tropical Medicine (Diploma of Tropical Medicine & Hygiene). Andrija Stampar Medalist, ASPHER (2008); German Hufeland Price (1979). For the last decade various public health projects in South Eastern Europe, Central Asia, the Middle East, West Africa, and in the Pacific Region.

g) George Lueddeke

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Originally from Canada, now residing in the United Kingdom, George Lueddeke [PhD, MEd, Dipl. AVES (Hon.)] is an education advisor in higher, medical and One Health education and leads the international *One Health for One Planet Education* initiative (1 HOPE) in association with national and global organisations. Publishing widely on education transformation, innovation and leadership, his current book is entitled Survival: One Health, One Planet, One Future, including “Ten Propositions for Global Sustainability.” His follow-up chapter, "Universities in the Early Decades of the Third Millennium: Saving the World from itself?," focuses on the development of an interconnected ecological knowledge system with a concern for the whole Earth. Both the latter chapter and a proposal to strengthen the Commonwealth *Curriculum Framework for the Sustainable Development Goals* are high on the list of his priorities during 2021 as is his engagement as co-programme director of the Future Africa - 1 HOPE Transdisciplinary Research webinar series, hosted by the University of Pretoria (South Africa) Centre for the Study of Resilience and Future Africa. Dr Lueddeke's latest on-line commentary is entitled Rebuilding Trust and Compassion in a Covid-19 World .

h) Linda Mans

Linda Mans (MSc) works as an independent consultant and researcher (Manskracht) in support of healthy people and a healthy planet - in The Netherlands and internationally.

Linda is a health scientist with over 20 years of experience as a policy advisor, consultant, researcher and lecturer. Her expertise is related to global health, health systems, health workforce, public health, environmental health, migration, gender & diversity, and social justice.

She worked as global health advocate for Wemos, a public health foundation advocating for social justice and health equity. She created and coordinated impactful networks of (civil society) organizations, universities, trade unions and policy makers to improve global public health. As researcher and lecturer at universities in Nijmegen and Amsterdam Linda focused on the intersection of health and gender and contributed to mainstreaming gender into Dutch medical curricula.

In addition to her original fields of expertise, supporting a 'Healthy Planet' became Linda's topic of interest and concern. Bird-watching, hiking and cycling made her aware of the importance of biodiversity and how it is affected by and interconnected with climate change. Apart from her consultancy activities in that regard, Linda engaged in a Gardening Project as an experiment; but it is also just fun and joy for her to watch plants grow into vegetables or fruits.

Linda studied Health Sciences at Maastricht University with a specialization in health education/ health promotion and gender studies.

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PERSONAL DATA

Peruvian, currently living in Peru. Date of birth: November 1st, 1985. Languages: Spanish: Native language; English: Advance; Italian: Advance; French: basic-intermediate

RESUME

Graduated as a Veterinarian and Animal Scientists (2010) with two international masters. WUR alumni (2013), and ITG alumni (2015), Certified on Global One Health by Wageningen University (2020). Lecturer at the School of Veterinary Medicine, Faculty of Health Science at the Peruvian University of Applied Science (UPC), Co-Chair at the One Health Social Science Initiative (OHSS), Funder and member of the One Health Latinoamerica and Caribe group OHLAIC). Research Interests: One Health, Planetary Health, policy and governance, infectious and zoonotic diseases in livestock.

EDUCATION

2004-2010. Veterinary Medicine and Animal Husbandry. Cayetano Heredia Peruvian University (UPCH)

2011-2013. **MSc. Animal Health Management**. Quantitative **Veterinary Epidemiology** and Adaptation Physiology groups, Wageningen University and Research. The Netherlands. Nuffic Scholarship.

2014-2015. **MSc. Tropical Animal Health**. Thesis was a collaboration between Animal Health and Public Health Department. Institute Tropical Medicine (ITM). Antwerp, Belgium. DGD Scholarship.

Nov-Dec 2020 **Certificate. International course. Global One Health:** Towards Human, Animal and Plant Health. Wageningen University & Research. Wageningen Centre for Development Innovation (WCDI). OKP Scholarship.

WORK EXPERIENCE

Nov 2020-present **RESEARCHER. Ethics subcommittee**. Faculty of Health Sciences. Applied Science University. Lima – Peru.

Feb 2019- Present **CO-CHAIR.** One Health Social Science Initiative.

Dec 2018-Present **FOUNDER.** One Health Latinoamerica y el Caribe.

Mar 2018-present **LECTURER.** School of Veterinary Medicine, Faculty of Health Science. Applied Science University. Lima – Peru.

May 2020 **SPANISH TRANSLATOR** One Health Lessons. Learning material for children and adults about COVID19.

Jan- May 2019 **One Health MENTOR.** International Student One Health Alliance.

Sept 2017-Jan 2018 **RESEARCHER UNICEF and USAID.** Risk Communication and Community Engagement for the Zika Response.

Oct 2016-Apr 2018 **ACADEMIC COORDINATOR** Master in Neuroscience**.** Cayetano Heredia Peruvian University.

Jan-Aug 2014 **RESEARCHER** at the Parasitology Department. US Naval Medical Research Unit No. 6 (NAMRU-6). Lab work. Detection Canine leishmaniasis by Elisa in the Amazon region (Madre de Dios), Peru.

Nov-Dec 2012 **CONSULTANCY**. "Environmental side-effects of antiparasitic medicines". A review of the known effects of commonly used anthelminthic and anticoccidial drugs on the environment. Wageningen University and Stichting Huize Aarde, the Netherlands

2009-2010 **ASSISTANT PROFESSOR** Veterinary Pathology and Veterinary Histology. Cayetano Heredia Peruvian University.

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RESEARCH WORK

Feb-Jul 2015 **Dissertation Thesis**: "Assessment of the concept of One Health in research in Peru. A systematic review". Institute Tropical Medical Antwerpen, Belgium.

Mar-Aug 2013 **Dissertation Thesis** "Quantification of transmission of White spot Syndrome virus within shrimp farming pond". Quantitative Veterinary Epidemiology group (QVE). Wageningen University, the Netherlands

Sept-Mar 2013 **Dissertation Thesis** "Effect of microbiota on the development of natural antibodies in Poultry". Adaptation Physiology group (ADP). Wageningen University (WUR), the Netherlands.

Aug- June 2010 **Dissertation Thesis** "Knowledge and preventive practices of toxocariosis in schoolchildren and their parents trained on the disease in 2006. District of San Juan de Lurigancho. Lima-Perú, 2010". (UPCH), Peru

j) Monalisha Sahu

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EDUCATION:

Doctor of Medicine (MD)	Department of Community Medicine, **Lady Harding Medical College & Associated Hospitals,** Delhi University**,** New Delhi.
Bachelor of Medicine & Bachelor Surgery (MBBS)	**Rajendra Institute of Medical Sciences (RIMS)**, Ranchi University, Ranchi, Jharkhand. Passed in first class with distinction.

Dr Sahu is currently working as **Assistant Professor, Department of Preventive & Social Medicine at All India Institute of Hygiene & Public Health** under ***Ministry of Health and Family Welfare, Government of India.*** She is currently involved in teaching, training and research activities for Medical Postgraduates for courses like MD (Community Medicine), MPH (Epidemiology), PGDPHM, DPH as well as Paramedical and Allied Sciences courses like DHPE and MVPH. She has also been **invited as Resource person/Guest faculty** at various organization of repute like the ICMR, ROHC (E), NICED, ESI PGIMER, Ministry of Corporate Affairs, Ministry of Defense etc.

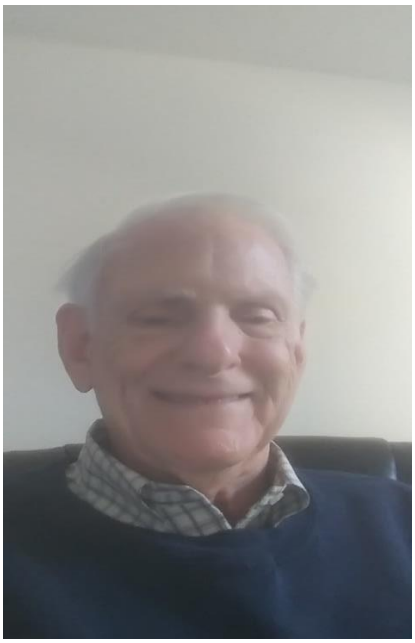
Her areas of Special interest lie in ***Health Promotion and Education, Occupational Health, Disaster management, Climate Change, Infectious Diseases and Maternal and Child health nutrition*****.** She is **Master Trainer** for **Maternal Infant and Young Child Nutrition,** Disaster Preparedness under CB-PHEM, Operational Research and Research Methodology Training. She has also been nominated as **National Expert** for research project on MIYCN in collaboration with IAP & FOGSI and core committee member for IAPSM, MIYCN. She was also course coordinator for Foundation Couse in Occupational health conducted by AIIHPH, Kolkata. She has also been nominated as an expert for Regional Consultation Workshop for Health Adaptation and Resilience: Advancing Strategic Knowledge and Capabilities by NIDM in Collaboration with World Health Organization.

She has authored and presented papers in many international, national and regional platforms, where her research papers have also been selected and won the slot of best research paper.

Presently, she is serving as an **Editorial Board Member** for journal **South Eastern European Journal of Public Health** and is serving as **Reviewer/Referee** for following journals:

- BMJ Case Reports
- Current Developments in Nutrition
- Indian Journal of Public Health
- Indian Pediatrics
- Journal of Obstetrics and Gynecology
- Journal of Comprehensive Health etc.

k) Richard Seifman



Richard Seifman

Richard Seifman has decades of experience in international development, mainly in health and nutrition with bilateral, multilateral, and nongovernmental organizations. As a United States Foreign Service Officer he served in Peru, Indonesia, Egypt, at the U.S, Mission to the United Nations, and in Rome, Italy as the U.S. Executive Director to the International Fund for Agricultural Development, and led United States Agency for International Development's global nutrition program.

With the World Bank, he led major projects in health and HIV/AIDS in Sub-Saharan Africa, and has been involved in its work on Ebola, One Health, climate change and health, antimicrobial resistance, and pandemics. He taught a seminar on HIV/AIDS and Development at the Elliot School of International Affairs, George Washington University, is an Honorary Advisor to the One Health Initiative, and a Board Member of the United Nations Association, National Capital Area. He is a frequent contributor to multiple publications including the Journal of Health Care Finance, The Lancet Global Health Blog, the online magazine "Impakter", and national newspapers on the COVID-19 pandemic.. A graduate of the University of Michigan, he has a Juris Doctor and Master of Business Administration from Columbia University.