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**ACTIONS ON HIV AND
HEALTH SECURITY ARE
MUTUALLY REINFORCING:
A CALL FOR BETTER INTEGRATION**

This is the third in a series of occasional papers produced by the Australian Federation of AIDS Organisations (AFAO) designed to disseminate information and analysis on HIV and key populations in the Asia-Pacific region. The papers build on AFAO's Consensus Statement on Australia's International Leadership Role on HIV, jointly endorsed by Australian HIV organisations working internationally, and are available at afao.org.au.

This paper has been jointly developed by the Australian Federation of AIDS Organisations (AFAO) and the UNAIDS Regional Office for Asia and the Pacific to disseminate information and analysis on issues relevant to HIV and key populations in the Asia-Pacific region.

About AFAO

AFAO is the peak organisation for Australia's community HIV response. We are recognised nationally and globally for our leadership, expertise and programs, and have worked in partnership with successive Australian governments for over 30 years to implement Australia's National HIV Strategy. Since the early 1990s, AFAO has strengthened civil society responses to HIV, health and human rights and contributed to effective policy engagement in Asia and the Pacific. AFAO's regional work today, led from our Bangkok office, includes the Sustainability of HIV Services for Key Populations in Asia (SKPA) program, funded by the Global Fund to Fight AIDS, Tuberculosis and Malaria.

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About UNAIDS

UNAIDS is leading the global effort to end AIDS as a public health threat by 2030 as part of the Sustainable Development Goals. Since it started operations in 1996, UNAIDS has led and inspired global, regional, national and local leadership, innovation and partnership to ultimately consign HIV to history. UNAIDS provides the strategic direction, advocacy, coordination and technical support needed to catalyse and connect leadership from governments, health development partners, the private sector and communities to deliver life-saving HIV services. UNAIDS is a problem solver. It charts paths for countries and communities to get on the fast track to ending AIDS and is a bold advocate for addressing the legal and policy barriers to the AIDS response.

UNAIDS generates strategic information and analysis that increases the understanding of the state of the AIDS epidemic and progress made at the local, national, regional and global levels. It leads the world's most extensive data collection on HIV epidemiology, program coverage and finance and publishes the most authoritative and up-to-date information on the HIV epidemic – vital for an effective AIDS response. The UNAIDS Regional Office for Asia and the Pacific is based in Bangkok, Thailand.

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Executive summary

Health security is on the minds of many in the context of the covid-19 pandemic, not only those who work in public health. What is global health security and how do HIV and other ongoing major communicable diseases fit in with acute health emergencies? Perspectives on the meaning of health security, its scope and its priorities vary, heavily influenced by contextual assessments of risks, but the covid-19 experience suggests that some level of global consensus is needed. This paper argues for a broad and integrated approach to global health security. There will doubtless be many papers, meetings and discussions on this critical issue; it is essential we get the outcomes of these discussions right.

Global health security and HIV

In 1994 the United Nations Development Programme (UNDP) included 'health security' in a list of seven categories of threats to human security, along with economic, food, environmental, personal, community and political security. 'Human security' is different from military, territorial or state security. The notion of health security is broad, and not limited to communicable diseases. Nor are threats to health constrained by international borders, a fact starkly underlined today by covid-19.

Health security is not just about acute public health events like covid-19. It also includes long-standing diseases and practices that are threats to personal health, and potentially to national and international health security. When, in July 2000, the UN Security Council discussed the impact of HIV/AIDS on peace and security in Africa, it was the first time that a health issue had been raised at the Council as a threat to security. Almost two decades later HIV was included in a 2019 World Health Organization (WHO) list of 'ten threats to global

health'. Since its emergence HIV has been a health security issue; it remains so today but over time it has received less attention in the health security context.

While HIV and other major communicable diseases are often captured within health security definitions and frameworks, the general perception is that health security relates more directly to novel and acute health threats such as SARS, MERS and, of course, covid-19 rather than established and ongoing major communicable diseases. This distinction between emergent and established diseases is readily evident in global and national financing, strategy setting and coordinating arrangements contributing to the fragmentation of health systems, which hampers their effectiveness and efficiency. Through a more collaborative and integrated approach, within the framework of universal health coverage (UHC), HIV and other existing disease control programs have much to offer to strengthen health security.

UNAIDS was established the same year that UNDP published its report on human security, although its antecedents stretch back to earlier periods of the global HIV/AIDS pandemic. The formation of UNAIDS as a joint program of six, now 11, UN organisations reflected a far-sighted recognition that HIV/AIDS was not merely a medical condition, but one that required a special UN program capable of organising a global response to an epidemic whose origins and effects extend into all aspects of society.

By the end of 2020, 1.85 million covid-19 deaths had been reported worldwide. Daily bulletins on the covid-19 death toll appear across all forms of media. Yet the 2.5 million deaths in 2019 from HIV/AIDS, tuberculosis and malaria reported by WHO in 2020 were

rarely mentioned outside the field of public health. The human suffering associated with HIV and other major communicable diseases is immense, especially in countries with under-resourced health systems and large inequities in access to care. Despite huge progress in the fight against HIV, many millions of people worldwide are not receiving treatment.

Covid-19 may change the balance of the global distribution of overseas development assistance for health. A focus on fast-spreading new epidemics may reduce attention to long-standing multi-country epidemics such as HIV, tuberculosis and malaria. If this happened, diseases would probably resurge and the investments and gains made so far in expertise, networks and infrastructure would be wasted. More optimistically, development agencies could seize the opportunity to work with governments worldwide to develop approaches that integrate control of ongoing major pandemics with preparedness for emerging health threats. Overall resources, however, are currently inadequate, and integration should not be used as a justification for reducing funding. A successful approach to global health security will require more resources from recipient countries' governments, global development assistance, the private sector and 'blended' financing mechanisms. All parties have a role to play, and a stake in, health security.

Lessons from HIV can strengthen global health security

Many lessons relevant to global health security now and in the future have been learned through decades of effort to prevent HIV and limit its impacts, including:

- Engage communities, learn from their knowledge, involve their leaders

- Promote and protect human rights
- Know, understand and respond appropriately to key and vulnerable population groups
- Trace, test, respond
- Advocate continuously for equity
- Show non-partisan political will and leadership and support multi-sectoral collaboration
- Collaborate across borders
- Don't count on an early vaccine
- Prepare for resistance to antimicrobial drugs
- Innovate beyond new health products
- Think long-term and stay the course
- Act now at a time of high concern.

These lessons should be acknowledged, analysed, discussed and incorporated into the development of future health security structures and plans. To not do so would be to squander the knowledge and expertise gained through decades of investment.

HIV infrastructure, systems and skills provide a base for health security

The global covid-19 pandemic has exposed the weaknesses and strengths of public health systems across the world. Considerable investments in health systems through programs to respond to HIV and other communicable diseases have put in place infrastructure, systems and trained personnel that provide a strong base for also responding to acute health crises. Examples are procurement systems and supply chains,

strong health information systems (increasingly digital) and safe laboratories. Leadership and management skills built up over decades can contribute much to global health security, as shown in the response to covid-19. A particular strength of HIV programs has been the building of capacity in the community-based non-government sector.

Well-conceived investments in strengthening systems for health must continue and be expanded as part of the global commitment to both global health security and UHC.

Multilateral and multi-sectoral collaboration – essential components

UNAIDS was created in 1994 because it was apparent that control of HIV could not be left to the health sector alone; it required multi-sectoral and multilateral collaboration. Today, UNAIDS continues to coordinate action across United Nations agencies and international development partners and, working with governments, supports regional and national coordination. Global achievements in tackling HIV are the result of this collaboration.

With the growing awareness of the risk of zoonotic diseases to human health, the concept of 'One Health' has grown in importance, recognising that human health and that of the environment are closely linked. This calls for collaboration across a broader range of sectors and partners.

Multilateral collaboration can work. The Access to Covid-19 Tools (ACT) Accelerator, initiated by WHO, has brought together governments, scientists, businesses, civil society, philanthropists and global health organisations to speed up development of new diagnostics, treatment and vaccines and attempt to ensure their equitable distribution. This mechanism was possible because of a long history of

multilateral collaboration and partnership in disease control.

HIV can benefit from the focus on health security

The continued fight against HIV and other major communicable diseases can benefit from the political will, urgency and innovation that arise in acute health crises.

After a series of epidemics over the past few decades, countries are well aware of the dangers of emerging diseases. In many countries, however, the measures taken fall short of the requirements of the 2005 International Health Regulations. Globally, concern for health security has increased.

Including major communicable diseases such as HIV, tuberculosis and malaria within the scope of health security could provide a reminder that they too are pandemics and urgent issues, and help ensure that they receive adequate resources; an integrated approach to ongoing pandemics and emerging threats could have great benefits for both.

Aligning the money with the strategy

For an integrated approach to global health security to be most effective, financing must be based on a rational strategy; this is not always the case.

Prevention of health problems that lack effective vaccines often receives inadequate attention and funding compared with diagnosis and treatment; inevitably, the number of people requiring treatment continues to grow. The deficiency in support for prevention of HIV and other diseases is a long-standing issue.

Preparation for unexpected health events is under-funded compared with the expenditure on responding to epidemics. As a consequence, when a disease outbreak occurs the response is delayed and/or less effective and an outbreak may become an epidemic. Once the epidemic is over and the immediate threat has passed, funding slumps rather than a reasonable budget being maintained for serious preparation for the next crisis. Both disease prevention and epidemic preparedness need to be better funded.

There is a lot of talk about integration, such as broadening single-disease programs to address several diseases where there is a logical synergy; more ambitious integration is also contemplated. Sensible integration would lead to more effective services, achieving economies of scope and/or scale. But are we serious about integration? There seems to be little inclination for the single-disease programs to move away from their current 'silos', with many risks perceived. So, is integration in fact unwelcome?

A sensible approach for HIV and other major disease control programs might be to seek integration with other, appropriate elements of the health system, especially those with a health security focus. Single-disease programs will eventually be forced to integrate for financial reasons, and would do well to be proactive rather than to find that they have been removed from, or marginalised in, the health department's organisational chart. Governments and donors should provide the right incentives for integration.

Conclusions

We need an approach to global health security that addresses major established multi-country epidemics and the sudden eruption of new infections. While there are differences between covid-19 and HIV (for example), there is a lot that they have in common, especially in the basic responses required to limit their impact.

A lot is to be learned from the decades of work of the programs to address HIV and other major communicable diseases, and a lot would be gained by their working together with efforts to improve global health security rather than as separate domains.

Effective response to all communicable diseases, whether acute or long-standing, requires certain elements to be effective. These include:

- genuine engagement with communities and community organisations
- strong basic health systems and a public health platform, ideally decentralised and adequately resourced
- quality-assured diagnostics and treatment
- close-to-real-time health data systems
- robust procurement mechanisms and supply chains
- a diverse range of technical expertise
- safe and competent laboratory networks
- continuous efforts to prevent or delay the emergence of antimicrobial resistance
- strong coordination mechanisms.

An integrated approach to global health security would break down silos and allow learning and collaboration across a range of diseases, more rapid responses when needed, and more efficient use of infrastructure, personnel and financial resources. It would also help ensure that long-standing pandemics are not pushed aside by acute crises. Global health security cannot be based on individual countries acting solely in their own national interest. The path to greater global health security must ensure that external support to the countries most affected by

disease threats is timely and adequate and recognises that the countries themselves know best their context and communities; that is, it must be in a spirit of global health solidarity.

There is a compelling case for an integrated approach to major communicable diseases, whether newly emergent or long-standing, as the pragmatically and ethically right approach and as the core of global health security, embedded within UHC. Failure to adopt such an approach in the aftermath of covid-19 would be a huge missed opportunity.

1 Global health security, HIV and other major communicable diseases

The question ‘What is health security?’ is on many people’s minds in the context of the covid-19 pandemic, not only those who work in public health. The week 15–21 March 2020 saw a threefold increase in the internet search term ‘health security’ compared with the rather consistent weekly average over the preceding five years (Google Trends accessed 3 November 2020). Inevitably the covid-19 experience will lead to many papers, meetings and discussions on the meaning of, and priorities for, health security. Perspectives on priorities will vary, heavily influenced by the perceived level of risk, but the covid-19 experience suggests that some level of global consensus is needed on future directions for health security. It is essential we get the outcomes of these discussions right.

The intention of the UNDP report was to propose, in human security, something very different from military, territorial or state security.

Health as a component of human security

The concept of health security started to receive attention, at least in the worlds of development assistance and global health, when the United Nations Development Programme’s *Human Development Report 1994*, in a chapter entitled ‘New dimensions of human security’, included health security in a list of seven categories of threats to human security, along with economic, food, environmental, personal, community and political security. Since that time many pages have been written about what these terms mean. One thing is clear: the intention

of the UNDP report was to propose, in human security, something very different from military, territorial or state security.

The 1994 report states (p. iii) that human security is ‘people-centred’, a term now used frequently when discussing effective disease control initiatives (UNDP 1994). The report suggests that human security has two aspects: ‘safety from such chronic threats as hunger, disease and repression’ and ‘protection from sudden and hurtful disruptions in the patterns of daily life’ (p. 35). It goes on to say that ‘the loss of human security can be a slow, silent process – or an abrupt, loud emergency’ (p. 35). Situating health security within this concept of human security makes it clear that the notion was intended to be broad and not limited by the characteristics of particular diseases.

UNAIDS was established in 1994, the same year that UNDP published its report on human security, although its antecedents stretch back to earlier periods of the global HIV/AIDS pandemic. The formation of UNAIDS as a joint program of six, now 11, UN organisations reflects a far-sighted recognition that HIV/AIDS was not merely a medical condition, but one that required a special UN program ‘capable of orchestrating a global response to a fast-growing epidemic of a feared and stigmatized disease whose roots and ramifications extend into virtually all aspects of society’ (UN 1995, p. 10).

Threats to health are not constrained by international borders, a fact underlined by the UNDP report in its discussion of HIV/AIDS. The report drew lessons from HIV/AIDS in highlighting the critical role of prevention in health security and the need for global

cooperation: 'to contain such diseases as malaria, tuberculosis, cholera and HIV/AIDS is clearly in the interest of all countries, and it is much more efficient to do this as a global joint initiative rather than country by country' (p. 67).

More than two decades later, there is still no widely accepted definition of 'global health security'. *The world health report 2007* (WHO 2007a) defined it as 'the activities required, both proactive and reactive, to minimise vulnerability to acute public health events that endanger the collective health of populations living across geographical regions and international boundaries'. This definition, which still stands little changed on the World Health Organization (WHO) webpage on health security, emphasises the cross-border nature of health security issues and focuses on action, rather than on the nature of the causes of the health events.

HIV as a health security issue

The use of the term 'acute public health events' in the WHO definition of global health security suggests a focus on suddenly occurring challenges, but the text of the report also refers to 'endemic diseases and practices that pose personal health threats, including HIV/AIDS, which also have the potential to threaten national and international health security' (WHO 2007a, p. 67). A World Health Day background document (WHO 2007b) lists eight 'issues linked to international health security'. The term 'emerging diseases' appears, but HIV/AIDS is one of few diseases specifically listed. Clearly, in 2007 WHO considered HIV/AIDS to be a health security issue.

In fact, the UN had recognised HIV/AIDS as a security issue seven years earlier, when in July 2000 the UN Security Council discussed the impact of HIV/AIDS on peace and security in Africa (UN 2000); this was the first time that the Council had discussed a health issue as a threat

to security. More recently, in a list of 'ten threats to global health' (WHO 2019a), HIV/AIDS was included (influenza, Ebola and dengue were the only other diseases singled out in the list).

In a 2014 handbook on global health security, a chapter entitled 'The many meanings of health security' concludes that 'health security is essentially contested[,] with a number of identifiable terms each reflecting a particular perspective and with its own narrative of health security' (McInnes 2014).

One of the multiple perspectives is reflected in the goal of the Australian Government's Health Security Initiative for the Indo-Pacific Region: 'To contribute to the avoidance and containment of infectious disease threats with the potential to cause social and economic harms on a national, regional or global scale' (DFAT n.d., p. 2). The strategic framework of the initiative recognises that 'endemic diseases including dengue, HIV/AIDS, malaria and tuberculosis can also provide entry-points to engage with governments on health security, and ... to build systematic capacity' (p. 8). This approach acknowledges that a health security issue need not be defined by a cross-border threat and that ongoing control programs for major communicable diseases can be used to build 'core capacities' needed to respond to emerging diseases. This paper supports such an approach and argues that existing disease control programs for HIV and other major communicable diseases are central to health security.

While HIV and other major communicable diseases are often captured within definitions and frameworks for health security, the general perception is that health security relates more directly to novel and acute health threats such as SARS, MERS and, of course, covid-19 rather than established and ongoing major communicable diseases such as HIV. This distinction between emergent and established diseases is readily evident in the global and

often national financing, strategy setting and coordinating arrangements for HIV and other major communicable diseases, which usually operate independently of systems for health security. This separation contributes to the fragmentation of health systems, which hampers their effectiveness and efficiency. Through a more collaborative and integrated approach, set within the framework of universal health coverage (UHC), HIV and other existing disease control programs have much to offer to strengthen health security.

The data support a balanced approach to global health security

In 2020 there had been over 1.85 million reported deaths from covid-19 (Worldometer). This number will double by mid-2021. The death toll from covid-19 has, rightly, been seen as catastrophic, with daily updates in all forms of media keeping this highly visible. Yet the 2.5 million deaths in 2019 from HIV/AIDS, tuberculosis and malaria, reported by WHO in 2020, (WHO 2020b, c, d), and even higher numbers in preceding years, would have gone unnoticed by most people beyond those working in global public health.

Deaths are not the only consideration. The human suffering associated with HIV and other major communicable diseases is immense, especially in countries with under-resourced health systems and large inequities in access to them. Enormous progress has been made in the fight against HIV; for example, in 2020, 27.4 million people living with HIV were accessing antiretroviral therapy, up from 6.4 million in 2009 (UNAIDS 2020a). However, in 2020 there were an estimated 37.6 million people living with HIV, meaning there were still many millions of individuals not receiving treatment.

If one concern about potential and emerging disease epidemics is the impact, beyond cases and deaths, on individual livelihoods, mental health and wellbeing, and national economies, such concern should apply equally to ongoing major communicable disease epidemics such as HIV. In 2018 the International Labour Organization estimated that in the period 2005 to 2020, lost earnings due to death or withdrawal from work attributable to AIDS would total \$US180 billion in 2010 dollars. The household care work for workers with severe AIDS was estimated to be between 300 and 700 thousand person-years in 2005. Child labour equivalents (calculated as a 21-hour week) amounted to 450 to 750 thousand person-years in the same year, and between 200 and 400 thousand children in AIDS-affected households were estimated to have experienced impaired education. While all of these numbers had declined markedly by 2020 they were still substantial.

It is recognised, at least at times like the present, that health security is a global issue and that 'we are all in this together'. However, high-income countries are selective about which diseases outside their borders merit their attention. If the justification for high spending on acute pandemics such as covid-19 is the enormous impact they have on lives and livelihoods, the same rationale should apply to HIV and other major communicable diseases. The essential difference with covid-19 is that it is having a calamitous effect on high-income countries as well as poorer ones.

There would be something morally troubling about high-income countries spending trillions of dollars on health security when they are exposed to a threat while turning their backs on ongoing pandemics that are no longer

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seen as a risk to them. Disproportionate concern with the possible effects of new – or as yet unknown – diseases, while ignoring diseases already ravaging humankind, is self-evidently unacceptable.

Health security and overseas development assistance (ODA) for health

Over the last decade or so there has been a trend among high-income countries to merge their development agencies with their diplomatic services, for example Canada, Norway, Australia and most recently the United Kingdom. This has usually come with a strong reaffirmation that development assistance must be in the national interest. With this orientation, we might expect a shift over time in ODA spending on health towards health problems that threaten the health of the donor country. Such a shift can be easily justified by emphasising that this is contributing to national health security and is thus unlikely to provoke significant criticism.

However, while health security concerns for novel and emerging health threats are more prominent in the agendas of development assistance agencies around the world, HIV and other major communicable diseases have continued to receive a significant proportion of ODA funding for health (Knox 2020). However, the proportion of ODA for health allocated

to control of STI/HIV fell from 43% in 2009 to 30% in 2018. In absolute terms STI/HIV funding dropped by 12% from 2017 to 2018, malaria funding dropped by 18% and tuberculosis funding by 20%. Inconsistent with this trend, the 2019 replenishment of the Global Fund to Fight AIDS, Tuberculosis and Malaria saw pledges of a record \$US14 billion for the next three-year grant period.

The balance of the distribution of ODA for health may change as a consequence of the covid-19 pandemic. An increased focus on preventing and controlling future epidemics of fast-spreading emerging diseases may be accompanied by less attention to the long-standing and as yet uncontrolled multi-country endemic and epidemic diseases such as HIV, tuberculosis and malaria. Other persistent health issues such as reproductive, maternal, neonatal and child health and non-communicable diseases may also receive less attention.

If this happened, both health security and HIV and other major communicable diseases would lose out. HIV and other major communicable diseases would lose out because attention would turn away from them before we had reached an acceptable level of global intervention coverage and control. This would probably lead to disease resurgence, squandering the gains already made through decades of substantial investments and effort. Health security would miss out as the expertise, networks and infrastructure that support the programs addressing ongoing pandemics and long-standing endemic communicable diseases would deteriorate and become unable to support the response to health emergencies; this was already apparent during the covid-19 crisis. Both health security and major communicable diseases would miss out on maximising the synergies and efficiency that could be achieved by integrated approaches.

A more optimistic scenario is one in which donor country governments, and lower income countries, while continuing to expand their support for health security, seize this as an opportunity to promote integrated approaches to HIV and other ongoing major communicable disease pandemics as well as to preparedness and response to emerging health threats. To do this effectively, however, donor organisations will need

to acknowledge that overall resources are currently inadequate and that integration is not a justification for reducing funding. A successful broader and more effective approach to health security is likely to require more resources from recipient countries' governments, global development assistance, the private sector and 'blended' financing mechanisms. All parties have a role to play, and a stake in, health security.

2 Lessons from HIV can strengthen global health security

The covid-19 pandemic has exposed the weaknesses and strengths of public health systems across the world. Many of the lessons being applied – or in some cases learned for the first time – are familiar to those who have worked on control programs for HIV and other major communicable diseases. In some countries, and to a significant extent globally, the expertise and systems developed through such programs have been the backbone of the response to covid-19. Large and consistent investments in HIV, tuberculosis and malaria control programs and in vaccine-preventable diseases have enabled large-scale, long-running and effective programs to be implemented, with many lessons learned along the way. In this paper we refer to these diseases collectively as ‘major communicable diseases’. Other communicable diseases that cause ongoing high levels of mortality, morbidity and social and economic impact are also relevant. Some of the lessons learned from long experience are highlighted below.

Engage communities, learn from their knowledge, involve their leaders

The most effective responses to the HIV pandemic have engaged with the public and communicated clearly and consistently with different population groups. They use appropriate language and engage agents they trust, ensuring that individuals and communities see themselves as part of the solution. The covid-19 pandemic has shown the consequences of failing to do so; confusion and lack of trust among communities have contributed to rapid growth of uncontrolled clusters of cases.

Top-down directives have failed where they have not been accompanied by genuinely caring engagement with particularly affected communities.

Effective community engagement is greatly facilitated by a public health system that has well-established sub-national components already in contact with the communities they serve. Public health systems of this kind have built community trust and increased understanding of the importance of prevention and of compliance with treatment, laying the ground for community responses to new threats when they occur. In the covid-19 context, top-down directives have failed where they have not been accompanied by genuinely caring engagement with particularly affected communities, involving their leaders and influencers. Heavy-handed enforcement of measures such as lockdown or quarantine, sometimes supported by police presence, can provoke fear and distrust, resentment at perceived or real discrimination and consequent non-compliance with public health advice, potentially leading to undetected disease transmission.

These lessons have been learned, and acted on, already over many years by organisations and governments working on HIV, which disproportionately affects marginalised and hard-to-reach populations. Such populations may not receive or respond to national messages, sometimes disseminated in a language or terminology they do not understand or by people they do not know or trust. Successful programs in the

prevention and response to HIV have had to address discrimination and stigma and have emphasised community engagement, community-led responses and the protection and promotion of human rights. Community engagement has been critical in programs to find and treat people with tuberculosis, and the most successful malaria control programs include strong community components. Similarly, well-conceived engagement with communities has been a key factor in bringing SARS and avian influenza virus outbreaks under control.

Effective response to health threats requires much greater attention to acknowledging and building capacity in communities.

Despite these experiences, the very detailed WHO Joint External Evaluation Tool (2018), which is used to assess the capacity of countries to meet the 2005 International Health Regulations, makes minimal mention of community engagement. For example, in the section on communication and advocacy there is no assessment of the capacity of community systems to participate, nor of the capacity of government agencies to tailor messages and target interventions to particular groups. In the surveillance section of the tool there is no assessment of the role of communities in early identification of unusual health events, in either humans or animals. Community engagement is mentioned in the section on response but only in relation to risk communication. There is acknowledgement that countries may have community-level workers for major communicable diseases, but no assessment of how these are engaged in emergencies. Effective response to health threats requires

much greater attention to acknowledging and building capacity in communities; this has been shown by the HIV experience, and lack of such capacity has been a factor in poor control of covid-19.

Experience with HIV has shown the importance not only of engaging communities but also of making the best possible use of civil society and community-based organisations. Even countries initially reluctant to see public or development assistance funding go to such organisations have come to recognise that they can play roles that government services cannot, such as reaching particular populations and working in sparsely populated remote areas. In times of a health crisis these resources can be rapidly deployed to help tackle the emergency. Working through civil society organisations also allows governments to support needed activities that may be unpopular with voters, such as the provision of sterile injecting equipment for people who inject drugs. In countries where engagement of such organisations is the norm, covid-19 has demonstrated how civil society organisations are effective at delivering messages and services to key populations such as sex workers, men who have sex with men, people who inject drugs, transgender people and prisoners, including those with whom they are in constant contact through their work on HIV (see for example APCOM 2020).

It is striking that the two countries that ranked first and second in the 2019 Global Health Security index (www.ghsindex.org) in terms of preparedness for health threats, the United States and United Kingdom, have been among the worst performers in managing covid-19, at least prior to the rollout of vaccines. This suggests that there is more to responses to outbreaks than the sophistication of the health system. Countries that ranked much lower in

the index have performed better; for example Vietnam (ranked 50th) and Cambodia (89th) have managed to keep covid-19 under control (at least at the time of writing this paper). Both countries have experienced SARS and avian influenza and have well-established mechanisms for working with communities, including through networks of community health workers working on HIV and malaria. Health authorities also have staff experienced in overseeing this type of work. These are likely to have been important factors in their response to covid-19.

For communities and civil society organisations to play their role to the full they have to be seen as an integral part of health systems at all levels of development, and of global health security.

For communities and civil society organisations to play their role to the full they have to be seen as an integral part of health systems at all levels of development.

Promote and protect human rights

In the early days of the HIV/AIDS pandemic, gross violations of human rights occurred, sometimes mandated by states, at other times a result of fear and stigma associated with HIV. Engaged public health officials and HIV activists quickly realised that promotion and protection of human rights would need to be an integral component of the response, as it still needs to be today. Major efforts have been made to promote and protect the human rights of people living with HIV, particularly among marginalised populations. These efforts include activities to reduce stigma and discrimination and to bring down legal barriers that criminalise populations and limit

their access to treatment and prevention. In 2019, worldwide, 690,000 people were reported to have died from AIDS-related illnesses (UNAIDS 2020b, p. 4); 62% of new infections were among key populations and their partners (p. 4). In the Asia-Pacific region this proportion was 98% (p. 154). For many who are unable to access treatment or prevention services, the barriers relate to breaches of their human rights, including: their right to live without discrimination irrespective of race, gender or lifestyle; their right to affordable healthcare; and their right to employment and a fair income.

Covid-19 has shown that in the face of an acute health threat, human rights can be put at risk. Rights can be revoked in the name of protecting the health of the nation. Decisive and authoritative management is needed in the response to epidemics, and some level of restriction of individual rights may be appropriate, for example limiting movement, but such restrictions must be applied proportionately and equitably. It must be ensured that invoking health security is not an excuse for arbitrarily curtailing human rights, especially for those whose lives are already precarious (Burrows et al., 2020).

Know, understand and respond appropriately to vulnerable populations

With hindsight it is possible to identify population groups that were particularly vulnerable to covid-19 infection from the start of the pandemic, such as elderly people in care facilities. Health and care workers in contact with covid-19 patients, but without experience in dealing with communicable diseases, were also at particular risk. In developed countries covid-19 has exposed the vulnerability of the casual workers who make up a large proportion of the workforce of aged care facilities and security services that were contracted to monitor quarantine

sites. Not only have workers in these services become infected but they have contributed to community transmission, in some cases because of their need to keep several jobs. Some high-risk population groups might not have been predictable; others should have been anticipated and targeted action taken earlier in the covid-19 response.

HIV programs have long recognised the need to know which populations are especially vulnerable yet often left out of efforts to control the spread and limit the health impact of the disease. Documenting the size and location of these populations and understanding them informs the design and planning of services and ensures that they are not left behind by prevention and treatment programs; these are hallmarks of effective HIV programs. Better analysis of who was at high risk and greater concern for different population groups, especially in countries with ethnically heterogeneous populations or significant inequity, would likely have led to better control of covid-19. State-wide measures and messaging could have been complemented by well-targeted approaches, working with relevant community groups where needed and included economic support.

Effective engagement between government, healthcare providers, affected communities, researchers and civil society organisations is built on trust.

A key lesson from HIV has been that effective engagement between government, healthcare providers, affected communities, researchers and civil society organisations is built on trust. This is a lesson that, unfortunately has

not been fully recognised in the response to covid-19. A feature of most effective responses to covid-19 has been rapid contact tracing and response. This is more difficult than it sounds and requires trained individuals and a well-managed plan. A key challenge of contact tracing is that many people will be reluctant to provide full and truthful information out of fear, embarrassment or for other reasons. Contact tracing must be based on trusted confidentiality. Unfortunately the covid-19 response has produced examples of breaching this confidentiality; in Australia, for example, the identity of an individual who was alleged to have spread the virus was indirectly revealed and the possibility of legal action raised (Toole et al. 2020). Such breaches of trust discourage others from coming forward to be tested or provide information. This is another example of an area of activity where much could have been learned from the experience with HIV.

Trace, test, respond

One of the characteristics of successful responses to covid-19 has been effective systems to trace, test and isolate contacts of known cases. This has built on experience gained over many years with other communicable diseases. One essential component of this has been the availability of quality-assured diagnostic tests. Ideally these should produce results rapidly at the point of care. Contact tracing has been, and still is, central to the control of outbreaks of communicable diseases, with some variations: for example, trace, isolate (cases) and vaccinate (contacts) during the 1970s eradication of smallpox; trace, test and treat in the case of STIs; and test, treat and track for current malaria elimination programs. Once again, HIV programs provide a wealth of experience in this area. As some key populations are difficult to reach and for diverse reasons may be wary of people seeking them out, HIV programs have had to

deploy skilled tracers, often involving members of peer groups. Building on this experience, with the need reinforced by covid-19, countries should aim to have cohorts of trained tracers who, with some guidance specific to any new disease, can be quickly brought into action. The best ground for ongoing practice and building skills is in ongoing communicable disease programs.

Advocate continuously for equity

While HIV programs have learned, and acted on, the importance of the engaging with communities, protecting and promoting human rights, and knowing and responding to vulnerable populations, their advocacy has not necessarily led to equity in the response to the HIV pandemic. The inequitable distribution of resources and interventions for the prevention and treatment of HIV is the result of underlying socio-economic inequality, cultural and political biases, the inequitable distribution of healthcare and other services, and at times simply poor planning. Another reason may be donors' insistence on achieving fixed targets and efficiency. Recipients of funding may then try to meet these targets by focusing on the populations easiest to reach and neglecting remote or marginalised populations that require more complex measures. Equity is almost always a victim unless it is kept central to program strategies; neglected population groups without a voice are unlikely to be able to ensure that happens.

In many contexts an emphasis on equity in programs to address major communicable diseases is kept alive only by persistent and smart advocacy by civil society or activist organisations. This is an important activity to finance through ODA, or through domestic funding even if the advocacy is essentially directed at the government.

Show non-partisan political will and leadership and support multi-sectoral collaboration

Countries that have done the best in tackling HIV, tuberculosis and malaria as well as other major health issues are those that have shown the political will to address them, to allocate government resources and to work collaboratively in partnership. Political short-sightedness and unpredictable funding in national budgets are disruptive for health programs in which continuous prevention, diagnosis, counselling and long-term treatment are needed, often for very large numbers of people. Adequate and consistent funding can never be taken for granted and often needs to be maintained through ongoing lobbying and advocacy. Long-running HIV and other major communicable disease programs, and especially their civil society partners, are a strong force in keeping advocacy for health funding alive.

Relatively early in the HIV/AIDS pandemic it was realised that it could not be addressed purely as a health problem, with responsibility falling entirely on the health sector. Countries set up national, and sometimes sub-national, bodies to bring together all the different sectors that could assist in controlling the disease, for example, health, education, the military, communication, transport and tourism. Legislative change was also crucial. These bodies continue functioning today and provide experience and a platform for coordinating multi-sectoral responses to other health issues. Cambodia has an impressive record in addressing HIV through a multi-sectoral approach and strong leadership, while building its health system to be better able to address acute health threats.

Covid-19 has demonstrated the importance of political will and policy coherence and of all the relevant parts of government working together. With clear leadership and cooperation, responses to covid-19 have been organised and more effective. Where discussion around covid-19 became highly politicised or the response fragmented, control of the pandemic was much more difficult and in some cases was lost altogether. Bodies that already have a long experience in cross-sectoral coordination in health programs should be seen and used as a strong asset in addressing health security concerns.

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Collaborate across borders

Covid-19 has illustrated vividly that fast-expanding outbreaks of a disease can start in a country with one person or a small group of individuals carrying the disease from across a border, by whatever means of transport. But a pandemic is not needed for cross-border threats to occur. A map showing the distribution of malaria cases in the Greater Mekong Sub-Region, the epicentre of resistance to antimalarial drugs, clearly indicates why cross-border collaboration and action are needed. Most of the cases are clustered in border areas, remote from large urban areas and where borders are often in the middle of vast forests, ill-defined and porous. This was the rationale driving the creation of a regional program, funded by the

Global Fund, to accelerate progress towards elimination of malaria in the sub-region. The program ensures that all countries are working in a common direction; no country is likely to sustainably eliminate malaria while the disease is present in neighbouring cross-border areas. In the sub-region, where cross-border movement is substantial (including migrant workers, some illegal and without access to healthcare), there are also challenges for other disease programs including HIV.

Similarly, the high level of drug-resistant HIV and tuberculosis in Papua New Guinea is a threat to northern Australia due to its close proximity and frequent cross-border travel by sea. While borders can be temporarily closed for acute epidemics, long-term health risks require more complex ongoing cross-border arrangements. Once in place these can be tightened in times of crisis.

Don't count on an early vaccine

Vaccines and well-managed immunisation services, for adults as well as children, are an essential and highly effective component of global health security. They need to receive adequate funding and every effort should be made to achieve high vaccination coverage rates. It is only because of vaccines that smallpox could be eradicated, polio eventually brought down to a very small number of cases, and deaths from influenza and childhood measles drastically reduced.

It is not surprising, therefore, that with each new communicable disease that emerges, the quest for a vaccine starts almost immediately and attracts substantial funding. The current covid-19 pandemic has triggered the most concentrated investment in vaccines for a single pathogen ever made and shown the value of ongoing research and development in vaccines.

However, history shows us that we cannot rely on a vaccine being developed early and bringing an epidemic quickly under control. Work on an HIV vaccine has continued for four decades, yet we still do not have one. Efforts to develop a vaccine against malaria have gone on for even longer.

The development of effective vaccines against SARS-CoV-2 has been unprecedentedly rapid and their impact is being seen in countries achieving high vaccination coverage. However, by 2 December 2020, when the UK became the first country to approve a vaccine for emergency use based on results from large-scale clinical trials (Ledford et al. 2020), almost 62 million cases and 1.4 million deaths had already been reported worldwide (WHO 2020e). Arguably, more investment in community engagement and community-led responses to covid-19, contact tracing and well-managed quarantine would have resulted in much lower morbidity and mortality early and throughout the pandemic. The covid-19 experience has made it clear that even when a vaccine is developed and tested, processes of approval, mass production on a huge scale and rollout of the vaccine to large populations all contribute to a long delay between vaccine testing for efficacy and safety and effective population coverage. This can be compounded by outright resistance to immunisation or poorly handled communication creating confusion and doubt.

There are many vaccine success stories and the covid-19 experience does show vaccines against some pathogens can be developed relatively rapidly, especially with ongoing research and new technologies. However, the long-running and as yet unsuccessful efforts to develop an HIV vaccine are a reminder not to put too many eggs in the vaccine basket. For prevention of the HIV, programs have had to rely largely on the difficult task of changing behaviour, on diagnosis and treatment and

some targeted interventions, to bring down rates of transmission. Preventive measures for HIV have rarely had the level of resources needed and that situation persists today. There are certain to be more diseases in the future with pandemic potential that will need multi-faceted long-term programs to slow their spread for some years before vaccines for them become available.

Behaviour change is a critical part of disease prevention and control. Unfortunately, it is often under-funded, in part because [of] a bias towards technology and medical interventions.

Despite its complexity, the promotion of behaviour change is a critical part of disease prevention and control. Unfortunately, it is often under-funded, in part because clinicians and some donors have a bias towards technology and medical interventions. Changes in social behaviour depend on building awareness and trust in a set of practices that can prevent or lessen the effects of a disease at a personal and population level, for example social distancing, improved hygiene behaviours, or use of personal protection equipment such as condoms or masks. For populations to believe that such practices are effective they need to be promoted by trusted agents. Once taken up, with reminders from time to time, they can be effective in diminishing the impact of most communicable diseases, including those yet to come.

Prepare for resistance to antimicrobial drugs

Resistance to antimicrobial drugs is recognised as one of the major threats to global health security. WHO rates it as one of the top 10 threats facing humanity. For example, drug resistance in *Klebsiella pneumoniae*, a common intestinal bacterium that can cause life-threatening pneumonia and septicemia, has spread to all regions of the world. The management of gonorrhoea has been complicated by resistance of *Neisseria gonorrhoeae* to at least five classes of antibiotics; in most countries an injectable antibiotic is the only remaining treatment. There are many more pathogens showing troubling resistance to standard antibiotics.

The control of HIV, tuberculosis and malaria is impeded, or complicated, by the emergence of drug resistance in the causative viruses and microorganisms (Review on Antimicrobial Resistance 2014).

In the face of widespread resistance to chloroquine and other antimalarial drugs, in 2001 artemisinin-based combination therapy was recommended by WHO as the treatment of choice for the predominant form of malaria. The new treatment was rightly heralded as a breakthrough and has been effectively used to treat hundreds of millions of people. One of its advantages was that using a combination of drugs makes resistance less likely to emerge. Yet, today, the Mekong region of South-East Asia faces drug resistance-related treatment failures with artemisinin-based therapy at such a rate that alternative approaches to first-line treatment are being sought. As drug-resistant malaria has spread in the Mekong region, progressively rendering different artemisinin combinations less effective, the process of switching to a new drug has not always been rapid. Introducing new drugs is not straightforward. Regulatory authorities in

countries need to agree to their registration (often a long process), national treatment guidelines must be revised and thousands of healthcare workers need to be retrained. If multi-drug-resistant malaria were to rapidly spread worldwide, the death toll from malaria would increase dramatically; years of progress would be lost.

WHO estimates that in 2018 half a million people were infected with drug-resistant tuberculosis. Only one in three of these people received treatment, of whom only 56% were treated successfully. Compliance with treatment of tuberculosis is made difficult by the complexity of treatment regimens and the duration of treatment, which for drug-resistant tuberculosis can be even longer than the normal six-month course. The search for improved treatments for tuberculosis continues; 22 drugs were in different stages of trial, 13 of them new compounds, in August 2020 (WHO 2020f). Drug development and approval are long processes and there is no guarantee of success.

Achievement of the global targets for reducing the impact of HIV, especially the target for the people receiving treatment having suppressed viral loads, depends on the availability of effective anti-retroviral drugs. While a range of drugs is available, resistance of HIV to such drugs – first noted early in the pandemic and continuing to spread – is a threat to achievement of these goals and to the lives of millions of people. WHO urged countries to regularly monitor the presence of HIV drug resistance, reporting that 49 countries had implemented surveys between 2004 and 2018, and 35 more were planning to do so (WHO 2019b). The report also emphasised the importance of monitoring quality-of-care indicators, as the spread of resistance is related to how well treatment is carried out.

Clearly it is difficult to develop drugs against pathogens that unpredictably emerge in humans for the first time. Nevertheless, global health security must prepare for the inevitability that more novel pathogens will appear.

The experience in malaria, tuberculosis and HIV highlights that over time, drug resistance is inevitable; sometimes it can occur quite rapidly. Experience with these major communicable diseases underlines the importance of anticipating and monitoring resistance and factors related to its emergence and the reality that the introduction of new treatments can take a long time.

However effective the current medicines are, a full and dynamic research and development pipeline is the best assurance that the world will not find itself without effective treatments.

The extensive work on these and other major communicable diseases provides a solid base of knowledge and, potentially, drugs that can be used against future threats. The battle against antimicrobial resistance needs to be a united one to ensure that the effort is efficiently using resources and has a higher chance of success. However effective the current medicines are, a full and dynamic research and development pipeline is the best assurance that the world will not find itself without effective treatments.

Innovate beyond new health products

There is much talk about the need for innovation to address major health challenges. Often, however, this is interpreted as the need for new vaccines, diagnostic tests, drugs or equipment. First, it is important to recognise that many of the currently available drugs against communicable diseases are highly effective; often the problem lies with their distribution and correct use. Innovation is required in getting diagnostics and drugs to those who need them and ensuring compliance with treatment. Repurposing existing drugs is another line of innovation.

Nevertheless, research and development of new products is critically important, as is acknowledged for vaccines and drugs in the two preceding sections of this paper. Clearly there can be huge benefits in treatments that are more effective, easier to deliver or less costly as well as easy-to-use sensitive diagnostic tests that allow rapid results from screening at points of care, in the field, or self-administered at home.

HIV and other major disease control programs, however, have demonstrated that innovation is also important in areas other than pharmaceutical development. A major breakthrough for the smallpox eradication program was the bifurcated needle, an inexpensive single-use needle with a forked tip designed to deliver just the right amount of vaccine by repeatedly pricking the skin in a small area of the upper arm. This simple tool made it possible for minimally trained personnel to safely vaccinate large numbers of people in a short time. Sometimes innovation is about using appropriate technology rather than new cutting-edge tools. The ubiquity of mobile devices and the growing use of telemedicine have triggered many innovations, for example in data management.

Beyond products, tools and equipment, but equally important, are innovations in delivery of services, whether preventive or curative. Use of peer educators to disseminate messages among vulnerable populations living with HIV is one example. In Thailand, HIV key population community health workers were trained to deliver pre-exposure prophylaxis (PrEP) to men who have sex with men (MSM) and transgender women. Directly observed treatment (DOT) was introduced into WHO guidelines for the treatment of tuberculosis to improve adherence and reduce errors in the taking of drugs. Community and family-based DOT approaches reduce the burden in travel and time lost for patients, while reducing caseloads in clinics. Innovation and change may also be found outside the health sector. In a Lancet series launched in 2014 researchers concluded that 'decriminalisation of sex work would have the greatest effect on the course of HIV epidemics across all settings' (Shannon et al. 2015). The evidence presented in this series is yet to be acted on in many countries.

'Decriminalisation of sex work would have the greatest effect on the course of HIV epidemics across all settings' (Shannon et al. 2015).

During covid-19 restrictions, innovative methods have been used to safely conduct mass distribution of insecticide-treated mosquito nets while maintaining social distancing. In some countries because of lockdown or limits on travel, patients have been given prescriptions or drug supplies (e.g. for antiretroviral treatment for HIV) to cover longer periods of treatment at home. Some of the innovations have demonstrated that

responses can be nimbler than in the past. The innovation in program delivery seen during covid-19 needs to continue, and governments and development agencies need to encourage it, building on lessons learned in the field, rather than constrain it through undue risk aversion, especially for community-level activities and working with hard-to-reach populations. Every successful service delivery innovation initiated by an HIV or other major communicable disease program will provide an example for responses to future acute epidemics.

Think long-term and stay the course

Few, if any, serious communicable diseases can be eliminated in a short time. Tuberculosis and malaria have been infecting humans for thousands of years. HIV, a relatively recent disease in humans, has already been with us for four decades. Influenza demonstrates its ability to adapt by coming up with new strains year after year. Yet all these diseases, and others, can be brought down to levels where they are manageable public health problems. Ambitious but plausible targets for reduction in HIV and tuberculosis have been defined. The world map of malaria is shrinking, with a number of countries targeting elimination by 2030. But the significant progress in controlling communicable diseases over past decades is the result of intensive and relentless efforts. Further advances towards ambitious targets will require the same. The history of malaria control shows vividly the consequences of relaxing efforts too early. For example, by 1961 malaria control in India had brought reported cases down to less than 50 thousand in that year; 10 years later, over a million cases per year were being reported. While drug and insecticide resistance played a role in resurgence of malaria, much of it was attributed to a collapse in control activities.

Decreasing funding and relaxing public health pressure on HIV have led, in some countries in the Indo-Pacific region, to an upturn in stigma, emergence of drug resistance and a second wave of infections. Lessons should be learned from this experience. Resistance of pathogens to available drug treatments, including for HIV, tuberculosis and malaria, raises the spectre of these diseases again becoming a major concern in countries where they are currently under control. A greater concern, especially for countries where they are endemic, is that attention and funding will turn away from them before we have achieved the goals set out.

For programs against HIV and other major communicable diseases and for broader health security, a long-term vision and commitment to stay the course is critical.

For programs against HIV and other major communicable diseases and for broader health security, a long-term vision and commitment to stay the course is critical. This is another argument for an integrated approach to health security covering HIV and other major communicable diseases as well as novel threats.

Act now at a time of high concern

It is easy to forget that in its early stages the HIV/AIDS epidemic was a cause for global panic. The news of a novel disease of unknown cause became public in 1981, but the virus responsible for it was not identified until 1983 and there was no commercially available diagnostic test until 1985. In those early years, a diagnosis of HIV was taken as a death

sentence. It is estimated that by 1985, 2.4 million people were living with HIV (GBD 2015 HIV Collaborators 2016). It is not surprising that as HIV spread rapidly across the world it produced a degree of panic among affected communities and anxiety among the general population. Fear of contagion, often based on limited or incorrect information, led to discrimination and even violence towards people suspected of being infected and their families and associates. Some were locked up and, in some countries, activities considered to be linked to the disease were criminalised or vigorously policed, provoking further fear and program constraints. Control measures were further undermined by conservative political and religious objections.

It was quickly realised by those most affected by HIV or engaged in its control that addressing it would require measures beyond the health sector and that the world was not well prepared for a pandemic of this kind. Advocacy by committed and determined activists and newly formed community groups raised awareness and put pressure on governments. Countries reacted differently – some early, some after many years of neglecting the issue. Australia, for example, unclear about the size and nature of its epidemic and concerned that HIV would spread rapidly, invested heavily in a campaign to inform the population about HIV in 1983, the same year the country had its first AIDS death. Early action is one of the reasons that Australia's HIV incidence rates remain relatively low. In Thailand and Cambodia, as the number of cases reached troubling levels, authorities reacted with vigour and creativity, along with strong leadership, and ultimately had successful control programs.

When HIV was seen as a dangerous new disease or when national epidemics reached levels where they could not be ignored, attention and resources were directed to it. As programs proved effective they drew

continued funding. However, history shows that when the incidence of a disease wanes, so does attention to it. This is undoubtedly a factor in the resurgence of HIV cases now being seen in some countries. In the Philippines, for example, there was an increase in annual new HIV infections of 207% from 2010 to 2019, along with a 338% rise in AIDS-related deaths. In 2019 just over 60% of people living with HIV who knew their status were on treatment and only 25% of pregnant women living with HIV received antiretroviral medicine to reduce the risk of mother-to-child transmission (UNAIDS 2021, 2020c).

Currently, the world is fixated on the covid-19 pandemic and the havoc it is causing. The interest and concern will not last.

Currently, the world is fixated on the covid-19 pandemic and the havoc it is causing. The interest and concern will not last. Already, as the rollout of vaccines progresses, albeit slowly at a global level, there is a sense, quite possibly very premature, that the end is in

sight. There is a risk that much of the attention will turn to vaccination while other measures to address the pandemic are still crucial and will be for some time. Once vaccination coverage reaches significant levels and the number of covid-19 cases falls, particularly in high-income countries, interest in it and the concern about future pandemics will fall away rapidly.

Now is the time to be making the case for a rethink of investments in health with a far greater emphasis on the prevention and control of existing diseases along with preparedness to address new or re-emergent ones. This is the time to be drawing attention to the need for a common, inclusive and integrated approach to global health security fully aligned with the drive for universal health coverage.

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3 HIV infrastructure, systems and skills provide a base for health security

In the last two decades it has been recognised that HIV and other major communicable diseases cannot be fully brought under control without investments in the systems and human resources that deliver key interventions. This reality is laid bare in the event of an acute threat: a key lesson from the 2014–2016 Ebola virus epidemic in West Africa was that weak health systems are catastrophically damaged by a crisis, as overburdening the health system causes diagnosis, treatment and care of other diseases to be neglected and eventually overwhelmed.

Considerable investments in health systems, including through programs for HIV, tuberculosis and malaria, have put in place infrastructure systems and trained personnel that provide a strong base for response to other communicable diseases, including unexpected and sudden events. Some key examples are mentioned here.

Sound procurement and supply chains – the backbone of service delivery

Organisations working on HIV and other communicable disease control across the world have long understood the importance of mechanisms to ensure adequate supplies of essential commodities at affordable prices, and reliable supply chains within countries to distribute them. At the global level considerable effort has been made to drive down prices for essential medicines and legal battles have been fought to overcome intellectual property rights barriers, to obtain drugs at prices affordable even by under-resourced health systems. Market shaping and quality control of

health commodities are not one-off activities; they need to receive attention continuously, which in turn requires consistent funding. For example, the Global Fund and Gavi, the Vaccine Alliance, both invest heavily in ensuring that essential products remain affordable and get to where they are needed across the world. The Global Fund's pooled procurement mechanism processes the distribution of quality-assured affordable key commodities for HIV, tuberculosis and malaria worth over \$US one billion per year. Wambo.org, an online marketplace for such commodities, provides all required information facilitating planning, budgeting and access.

These and other global organisations and the networks and supply chains they have supported have proven enormously helpful in the response to covid-19. Early in the pandemic the importance of health commodity procurement and supply chains quickly became apparent, in this case particularly for personal protective equipment, diagnostic equipment and intensive care equipment. Years of investment and experience in securing good-quality commodities at affordable prices, through pooled procurement mechanisms and other measures, and in strengthening distribution systems, have proven their worth in the covid-19 crisis. One example is the WHO-led, multi-partner Access to Covid-19 Tools (ACT) Accelerator, which aims to speed up the development of, and ensure equitable access to, diagnostics, treatment, vaccines and support for essential health system improvements across countries. The processes and infrastructure of immunisation programs supported by Gavi over several decades are instrumental in the distribution of SARS-CoV-2 vaccines to and

within countries. These systems and those for supplying other essential commodities for HIV and other major communicable diseases programs are critical to global health security; they will require ongoing investment to ensure that they remain in place to facilitate rapid responses to future health security threats.

Strong health information systems – the key to planning, targeting and monitoring

Meaningful planning and implementation of disease control programs requires good quality data, as do monitoring and evaluation. This includes forecasting the quantities of commodities needed, distribution of staff according to need and efficiently targeting financial resources. Health information systems have been found to be weak in many countries, often depending on paper-based information that is collated manually and transferred through many levels of bureaucracy. The time lag between data collection and final reporting often renders the information of little use to program managers, and data are sometimes manipulated. The response from disease-specific programs has often been to create stand-alone information systems for their disease. Despite years of investment in health information systems by governments and development assistance agencies, major communicable disease control programs in developing countries often rely on data that is months old, and global level analysis is typically based on data one or two years out of date. The latest *World Malaria Report*, for example, published late in 2020, presented information on the cases, deaths and program interventions in 2019; this is of limited value when used to inform resource allocation and activities in 2021.

In the last decade, however, there has been a strong call for strengthening countries' national health information systems and

moving to digital platforms at all levels. Considerable investments have been made to do this. The Global Fund, for example, has supported the rollout of HMIS-2, an open-source online district-level information system that can be customised to meet country needs. As well as information on cases and deaths and treatments provided, it can also collect information on stock levels to facilitate distribution of commodities. These investments can be leveraged to the benefit of healthcare broadly, not just a limited number of diseases. It is important to ensure that systems introduced through development assistance are interoperable with existing systems and can be expanded to serve the health system broadly, not just one or a few diseases.

Improving the quality, timeliness, analysis and use of epidemiological and programmatic data is a priority.

One lesson learned from the covid-19 crisis is that data can be rapidly collected, reported, analysed and used to guide our actions. It is widely perceived that information on covid-19 cases and deaths may not be complete and that in many countries the actual numbers may be many times higher than those reported. Nevertheless, whether complete or not, the information has been essential to guiding the response; a large part of its value is that it is compiled and reported daily. The more the information is broken down and continuously analysed, the better responses like contact tracing or quarantine can be targeted and the bigger the impact.

Covid-19 has demonstrated that it is possible to have close to real-time data, using communications technology that facilitates rapid

recording and reporting. Improving the quality, timeliness, analysis and use of epidemiological and programmatic data is a priority both for HIV and other ongoing communicable disease control programs and health security more broadly. Information systems strengthened through investments in HIV and other major communicable diseases should be built on for stronger overall disease surveillance.

Laboratories – sharing common ground

All efforts at communicable disease control need accurate diagnostics, including point-of-care tests and testing in laboratories ranging from simple set-ups for diagnosing cases in clinics and hospitals to more sophisticated laboratories where more complex tests, quality control and research can be conducted. In some cases high-security labs are needed for the handling of dangerous pathogens. Laboratories are expensive to build, equip and run. Although some specialist laboratories, or specialist areas within general laboratories, may be needed, each disease program should not have to set up dedicated and separate laboratories, especially in countries with limited financial and human resources. Laboratory equipment can be used to diagnose different diseases. For example, the Gene-Xpert devices, which have been widely distributed for testing for TB, can be used for detection of the SARS-CoV-2 virus. Integrated laboratories that deal with diagnosis and research on HIV and other ongoing communicable diseases can also provide needed services in the event of increased demand due to sudden health emergencies.

Committed leadership and smart management exist – to be valued and used

After the eradication of smallpox worldwide, the Expanded Program on Immunisation was launched in 1978. While delivery of vaccines to children was its clear and straightforward aim, the approach was innovative. National and sub-national program managers were trained to plan, implement and monitor programs, and health workers at district and health facility level were trained in 'supervisor skills'. Problem solving (e.g. in vaccine transport) was given high priority. These practices were taken up by programs against childhood diseases more broadly. Simple, colour-coded algorithms adaptable to country contexts were another characteristic of these programs. These so-called 'vertical programs' trained thousands of leaders in public health across the developing world, and many went on to higher positions in their government systems. In more recent decades, programs to address major communicable diseases (particularly HIV, tuberculosis, malaria and vaccine-preventable diseases) have continued to provide training and support in planning, management, monitoring and evaluation, health information systems, communication, procurement and supply chain management. This has not, as in the past, been limited to government health officials but has also built capacity in countless civil society and other non-governmental organisations. In the covid-19 context there are many reports of these resources being utilised, but there are also examples of them being overlooked to the detriment of the response. Leadership and management skills built through HIV and other major communicable disease programs should be valued and used in the development and management of robust health security systems.

Community systems – just the beginning

The now common reference to ‘health systems’ and, by UNAIDS, ‘systems for health’, rather than the, singular, ‘health system’, is perhaps most visibly promoted by the Global Fund’s introduction of the term ‘resilient and sustainable systems for health’. It represents a significant change. It recognises that there is not just one government (or private) health system, but several systems working together. The most important change is the recognition of community health systems. People who work on HIV have recognised that community health systems and organisations are not just nice to have as partners but critically important to the success of control programs. Their roles in response to health challenges

can include community engagement, service delivery, making communication relevant and trustworthy, monitoring the health sector more broadly, lobbying for change and, no doubt, other roles yet to be discovered.

Health security will be much stronger if built with the full engagement of community systems, both those supported through HIV and other major communicable disease control programs and those yet to be given the chance to contribute.

Health security will be much stronger if built with the full engagement of community systems.

4 Multilateral and multi-sectoral collaboration – essential components

In 1994 when UNAIDS was created, it was recognised that control of HIV was not something that could be left to the health sector alone. At all levels, it would require collaboration among multiple sectors: health, education, tourism, transport, security forces, finance, the private sector, civil society and more, as well as coordination and governance bodies at all levels. It was also realised that, given the magnitude and multi-sectoral nature of the challenge, development partners would need to work together to ensure complementarity and efficiency of their efforts. UNAIDS was created for just that purpose and has been at the centre of coordinating action across UN agencies and international development partners and, working with governments, supporting coordination at regional and national levels. The achievements that have been made in tackling HIV over the past decades are the result of multilateral and inter-sectoral collaboration.

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While it is evident that programs to fight HIV require a broad range of entities to collaborate, this is also important for other communicable diseases. Where a zoonotic disease is involved, for example, a broad but different range of global and national partners needs to be involved and coordinated. Growing awareness that the sources of most new diseases in humans have been zoonotic has bolstered support for 'One Health', an

approach recognising that human health is closely linked with the health of animals and the environment in which we live. Attention has been drawn to this reality by the epidemics of avian and swine influenza as well as SARS, MERS and Nipah viruses, all diseases associated with animals. The One Health approach acknowledges that human health security will require action to protect the health of animals and measures to avoid unhealthy contact between humans and animals, improved animal husbandry and greater attention to food safety measures. Antimicrobial resistance is another area in which the One Health approach is important, given the very significant use of antibiotics in animals and the emergence of pathogens resistant to antibiotic classes also used in humans. Clearly, One Health requires inter-sectoral collaboration on the ground; at a global level this calls for a strong multilateral coordination among agencies dealing with different dimensions of the health of our planet. One Health, as a collaborative, multi-sectoral and transdisciplinary endeavour could learn from the experience of UNAIDS.

UN agencies have a key role. WHO has, since its creation, guided multilateral responses to many health issues, both chronic and acute; UNICEF has a strong role in child health; and action against zoonotic disease is coordinated by the World Organisation for Animal Health (OIE; <https://www.oie.int/about-us/>) and the Food and Agriculture Organization (<http://www.fao.org/home/en/>).

UNAIDS has been the central organisation in the global response to HIV. The US Government's President's Emergency Plan for AIDS Relief (PEPFAR), launched in 2003,

has been a major player in HIV, and supports HIV programs in over 50 countries. The UK, France, Netherlands and Japan are also significant contributors, among many, to global efforts to tackle HIV.

The Global Fund, as a financing agency, relies on a range of partners to support the implementation of the programs it funds. During the response to covid-19 it has been able to use its partnership model to be a key player in global efforts to control the pandemic, following the technical lead provided by WHO.

In April 2020, WHO launched the Access to Covid-19 Tools (ACT) Accelerator, which 'brings together governments, scientists, businesses, civil society, and philanthropists and global health organizations (the Bill & Melinda Gates Foundation, CEPI, FIND, Gavi, The Global Fund, Unitaid, Wellcome, the WHO, and the World Bank)' (www.who.int/initiatives/act-accelerator/about). The initiative has four pillars: diagnostics, treatment, vaccines and health system strengthening. In addition there is a cross-cutting workstream on access and allocation aiming to ensure equitable distribution of existing and newly developed commodities. In September 2020, for example, the ACT Accelerator announced that it would be providing 120 million high-quality rapid diagnostic tests for covid-19 to low- and middle-income countries. Such an agreement could not have been reached without strong collaboration among partners. The vaccine component of the ACT Accelerator, known as COVAX, is co-led by Gavi (the Vaccine Alliance), the Coalition for Epidemic Preparedness Innovations (CEPI) and WHO. As of August 2020, 172 countries, including 92 low- and middle-income countries, had signed up to this endeavour, which aims to ensure fair access to SARS-CoV-2 vaccines (WHO 2020g). As of 7 May 2021, 54 million vaccines had been delivered to 121 countries through the

COVAX facility (www.gavi.org/covax-facility). Advocacy to ensure that the vaccines are made available to all that need them is being vigorously promoted by the People's Vaccine Alliance (<https://peoplesvaccine.org/>), a coalition of organisations including UNAIDS, Free the Vaccine, the Yunus Centre, Frontline AIDS, Oxfam and SumOfUs. It is to be expected that the first concern of

A coherent approach to global health security will need to expand substantially the early foundations of 'global health solidarity' triggered by covid-19.

responsible governments in a pandemic is for the wellbeing of their own people. In response to covid-19, however, the level of collaboration between countries, multilateral agencies, development agencies, the private sector and other partners, has been exceptional. The mechanisms put in place to manage this collaboration could be developed rapidly due in part to a long history of multilateral collaboration and partnership in HIV and other areas of disease control. Nevertheless, despite commitments and mechanisms for ensuring equitable distribution of SARS-CoV-2 vaccines the first months after the approval of effective vaccines saw a high degree of 'vaccine nationalism', a strong determination to look after domestic needs before sharing vaccines with other countries in need. This, and a slow start to rollout of vaccination in some countries underlines the failure to fully understand, and act on, the reality that in a pandemic no country is safe until all countries are safe. A coherent approach to global health security will need to expand substantially the early foundations of 'global health solidarity' triggered by covid-19 to ensure that in future no country or population is left behind.

5 HIV can benefit from the focus on health security

The continued fight against HIV and other major communicable diseases can benefit from the political will, urgency and innovation that arise in acute health crises. The response to covid-19 has shown that governments around the world and multilateral institutions can be more agile, more flexible and less bureaucratic than they are in 'normal' times. HIV and other major communicable disease programs should benefit from these institutions' realisation that they can move quickly when a sense of urgency is applied.

Worldwide, health security is a growing focus of government attention, driven by a number of threatening epidemics over the past few decades and currently by covid-19. Most countries are well aware of the dangers of emerging diseases and, within their capacity, have taken measures to be better prepared by working to meet the requirements of the 2005 International Health Regulations. In many countries the measures still fall far short of the need. For higher income countries, less affected by recent epidemics (with the exception of covid-19), the increased focus on health security has mostly been around keeping epidemic diseases out of their

countries or nipping them in the bud if they do sneak in. This has, however, not only been about action at home but also about ensuring potentially more vulnerable countries are well prepared; a significant component of overseas development assistance (ODA) for health is now delivered with health security in mind.

Use of the term 'health security' suggests that a health issue needs to be taken seriously and addressed urgently. Considering major communicable diseases such as HIV, tuberculosis and malaria within the scope of health security could bring them back into the spotlight, highlight their importance, provide a reminder that they too are pandemics and urgent issues, and help ensure that they receive adequate resources. An integrated approach to ongoing pandemics and emerging threats could have great benefits for both.

6 Aligning the money with the strategy

For an integrated approach to global health security to be fully effective, financing must be based on the strategy, rather than the strategy based on financing. Two areas that are problematic in this regard are prevention/preparedness and integration.

Prevention is systematically under-resourced, as is pandemic preparedness

The adage that ‘prevention is better than cure’ is at least 500 years old and still makes good sense today. Unfortunately, for a number of reasons, prevention of communicable diseases, except those for which there are effective vaccines, receives inadequate attention and funding compared with diagnosis and treatment. This is the case with HIV. One of the reasons is that available funds are needed to provide treatment for those who are already infected and it is difficult to withhold treatment in order to fund prevention activities. Another is that prevention, especially for marginalised populations, requires engagement with issues that may be politically and socially sensitive. In the long run, however, inadequate funding for prevention makes little sense, as without it the number of people requiring treatment continues to grow. This deficiency in support for prevention of HIV and other diseases is a long-standing issue not yet well addressed. Hard earmarking of a certain proportion of funding allocated to a disease program for prevention may be the only solution. HIV in particular needs more funding devoted to prevention.

Lack of preparedness means that when an outbreak of disease occurs the response is less efficient.

A parallel concern in addressing acute health security threats is that preparation for the occurrence of unexpected health events is under-funded. Lack of preparedness means that when an outbreak of disease occurs the response is less efficient and the consequent delay in interrupting transmission can lead to an epidemic and potentially a pandemic. Once the epidemic is over and the immediate threat has passed, the tendency is for the surge in funding for the response to the epidemic to slump back to low levels rather than a reasonable budget being maintained for serious preparation for the next crisis.

Just as prevention of individual diseases requires a greater share of funding ... so too does preparation to deal with future epidemics.

Just as prevention of individual diseases requires a greater share of funding than it currently receives, so too does preparation to deal with future epidemics. Not doing so will lead inevitably to the huge costs associated with responding to a pandemic and the economic havoc that it causes, as we have seen with covid-19. Once covid-19 has passed, however, it is likely that funding to prepare for ‘the next covid’ will be a trickle compared with the outpouring of money for the response. We must ensure that this does not happen.

The elusive aim of integration – are we serious?

Most discussions about the way forward mention 'integration' in some way or another, sometimes without great clarity about what it entails. At one level this may be about broadening single-disease programs to address two or more diseases where there is a logical synergy. Integrating HIV and tuberculosis programs or integrating HIV with efforts to control other STIs, viral hepatitis or other co-infections makes good sense. Then there is a broader ambition of bringing the major communicable diseases into the health security arena.

Given the strong logic of an integrated approach, there is a lot of talk about it. But are we serious? Today, mention of the 'verticality' of disease control programs is usually met with the response that this terminology is outdated, unhelpful, one side of a false dichotomy etc. It is pointed out that programs that focus narrowly on specific diseases and broad strengthening of the health system are mutually supportive; all that is needed is a more integrated approach. At the same time there seems to be little or minimal inclination for the single-disease programs to move away from their current 'silos'.

There is no denying that the single biggest factor behind the radical transformation of the response to HIV, tuberculosis and malaria in the last two decades is money. And it is hard to deny that the way money is allocated shapes, and ultimately maintains, the structure of the response. So, is some of the talk about an end to 'verticality' and the move to integration disingenuous?

Some ambivalence about the integration of single-disease programs is to be expected. There are real, and not negligible, risks. These include: the risk of a decrease in funding and downsizing of staff, when the financial and human resources available are already insufficient to do the job fully, or of being merged with a less well-funded entity; a loss of expertise as staff (especially the most experienced) are moved on to tasks that involve other health issues than the ones in which they have developed deep knowledge and skills; inefficiency or ineffectiveness with the integration of some actions that are best done with a singularity of purpose; and a loss of the hard-fought visibility achieved over many years for a particular health problem. Integration may also inadvertently lead to stigma and discrimination as workers and communities unaccustomed to working together, and with different priorities and biases, are forced to work together. These risks are real, but not insurmountable.

It would seem that a sensible approach would be for major disease control programs to start working now with other elements of the health system, and especially those being developed with a health security focus, to discuss which components of their program are most amenable to integration soon, in some defined time from now (depending on how things evolve) or 'not at all'. The last category might include components that really do need high-level expertise in single-disease teams. It is likely that integration of different components of the health system should have less to do with the biological nature of the diseases concerned and more to do with the nature of program delivery, especially in its most

challenging dimensions, such as working with vulnerable populations. Health issues that are predominantly addressed through diagnosis and treatment may be easily integrated into the general health services. Those that require intensive community-based work, for example on preventive measures or case-finding and motivating people to seek treatment, might be integrated to take advantage of common expertise and infrastructure.

Disease control programs would do well to be proactive, even take the lead, in the integration of their programs.

At some point, integration of single-disease programs will occur, driven by financial considerations. Disease control programs would do well to be proactive, even take the lead, in the integration of their programs rather than to find quite suddenly that they have been removed from, or marginalised in, the health department's organisational chart. Government and donor funding mechanisms should incentivise rather than undermine integration where it is appropriate.

7 Conclusions

This paper has argued for an approach to global health security that includes HIV and other major established multi-country epidemic communicable diseases as well as emerging infections like covid-19 that suddenly erupt. While there are differences between covid-19 (the current undisputed exemplar of a health security threat) and HIV (another devastating but somewhat forgotten pandemic), there is more that makes them similar, especially in the fundamental aspects of effectively limiting their impact.

There is a lot to be learned from the decades of work on programs to address HIV and other major communicable diseases and a lot to be gained by their working together with efforts to improve global health security rather than as separate domains.

Effective response to all communicable diseases, whether acute or long-standing, requires certain elements. These include:

- genuine engagement with communities and community organisations, not just as compliant recipients or suppliers of services but as co-owners of the solution, as peer communicators and educators, as partners in program planning, and as leaders and monitors of program performance
- strong basic health systems and a public health platform, ideally decentralised and adequately resourced, from which to engage with communities and deliver services
- health data systems that can deliver data of sufficient quality, and in real time, to guide action and make the best use of inevitably limited resources
- robust procurement mechanisms that can ensure purchase of quality goods at affordable prices and supply chains to deliver them
- technical expertise in epidemiology, sociology and communications, as well as clinical care, and systems that allow experts in various fields the time and support to continuously analyse public health responses and learn how to improve them
- the ability to maintain rapid-response systems for screening, testing and laboratory diagnosis, or to set them up fast enough to be helpful in interrupting transmission
- trained contact tracers who can work with all populations including the most marginalised
- continuous efforts to prevent or delay the emergence of antimicrobial resistance or the decreased efficacy of other substances used, for example in vector control
- an established mechanism for engagement of multiple sectors that are affected by the disease or contribute to its control.

It is apparent that each of the elements listed above need not be separately developed for each disease or group of diseases. Countries would do well to develop systems, across public health as well as clinical services, that can ensure these elements are continuously in place but can be scaled up as needed. The smart way to do this would be to ensure that ongoing interventions for HIV and other communicable diseases are well resourced and serve as a platform for rapid response to epidemics when they occur. Additional elements and particular expertise will still be needed to respond to specific threats.

For example, effective responses to some communicable diseases may depend on a One Health approach, especially where there is a strong association with animal or plant health or environmental hazards. One Health should be part of the discussion of how global health security is taken forward.

Many aspects of health security depend on access for all people to adequate health services, that is, universal health coverage (UHC). Health security both relies on and is an integral part of UHC. As the world moves forward with efforts to strengthen global health security and achieve UHC there must be strong alignment.

An integrated approach to global health security would ... help ensure that certain long-standing and still devastating pandemics are not pushed aside by a focus on new threats and acute crises.

An integrated approach to global health security would break down silos and allow learning and collaboration across a range of diseases, more rapid responses when needed, and more efficient use of infrastructure, personnel and financial resources. It would also help ensure that certain long-standing and still devastating pandemics are not pushed aside by a focus on new threats and acute crises.

The boundaries of global health security should not be constrained by words such as unpredicted, emergency, acute or urgent, implying that only certain sudden and rapidly spreading diseases merit serious responses. While the importance of the rapidity of response varies across diseases, most end

up needing sustained, long-term efforts. Even when a vaccine is available, it may take a long time to deliver it to all who need it. New generations will be born that need to be vaccinated. Continuous mutations of a causative pathogen may mean repeated rounds of vaccination are needed to keep it at bay. Epidemics should not be given less attention just because they have moved from being considered as acute to chronic.

The future approach to global health security cannot be based on individual countries acting solely in their own national interest. Global health security, in a densely interconnected world must be based on global health solidarity. Covid-19 has certainly made the whole world aware of its interconnectedness and of the broader implications of a pandemic but the political response to covid-19 has been disproportionately, if unsurprisingly, oriented towards self-protection. The path to greater global health security must ensure that external support to the countries most affected by disease threats is timely and adequate and recognises that the countries themselves know best their context and communities; that is, it must be in a spirit of on global health solidarity.

There is a compelling case for an integrated approach to HIV and other major communicable diseases, whether newly emergent or long-standing, as the pragmatically and ethically right approach and as the core of global health security, embedded within UHC. Failure to adopt such an approach in the aftermath of covid-19 would be a huge missed opportunity.

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List of abbreviations

ACT	Access to Covid-19 Tools
AIDS	acquired immune deficiency syndrome
APCOM	Asia Pacific Coalition for Men's Sexual Health
CEPI	Coalition for Epidemic Preparedness Innovations
DFAT	(Australian Government) Department for Foreign Affairs and Trade
DOT	directly observed treatment
Gavi	Vaccine Alliance
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HIV	human immunodeficiency virus
HIV/AIDS	HIV infection and/or AIDS
MERS	Middle East respiratory syndrome
MSM	men who have sex with men
ODA	overseas development assistance
OIE	World Organisation for Animal Health
PEPFAR	(US) President's Emergency Plan for AIDS Relief
PrEP	pre-exposure prophylaxis
SARS	severe acute respiratory syndrome
SARS-CoV-2	severe acute respiratory syndrome coronavirus 2 (the cause of covid-19)
STI	sexually transmissible disease
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund (formerly United Nations International Children's Emergency Fund)
WHO	World Health Organization

