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From Panic and Neglect to Investing in Health Security

Financing Pandemic Preparedness at a National Level

International Working Group on Financing Preparedness

From Panic and Neglect to Investing in Health Security:

Financing Pandemic Preparedness
at a National Level

INTERNATIONAL WORKING GROUP ON FINANCING PREPAREDNESS

Peter Sands (*Chair*), Harvard Kennedy School
Dominic Casserley, formerly Willis Towers Watson
Rodrigo Chaves, World Bank Group
Timothy G. Evans, World Bank Group
Sanjeev Gupta, International Monetary Fund
Judith Hazlewood, McKinsey & Company
Dean Jamison, University of Washington
Donald Kaberuka, African Development Bank
Marie-Paule Kieny/Agnes Soucat, World Health Organization
Outi Kuivasniemi, Ministry of Social Affairs and Health, Finland
Soonman Kwon, Asian Development Bank
Jane Pepperall, Department of Foreign Affairs and Trade, Australia
Alwyn Didar Singh, Federation of Indian Chambers of Commerce and Industry
Oyewale Tomori, Nigeria Academy of Science
Jeanette Vega, Fondo Nacional de Salud, Chile
Ron Waldman, United States Agency for International Development
Edward Whiting, Wellcome Trust
Ngaira Woods, Blavatnik School of Government

Statements, recommendations, and opinions expressed are those of the International Working Group on Financing Preparedness (IWG).

The World Bank served as Secretariat for the IWG. The World Bank team was led by Mukesh Chawla, and included (in alphabetical order, by last name), Franck Berthe, Senior Livestock Specialist; Eleonora Cavagnero, Senior Economist; Erika Hartingh, Consultant; Samhita Kumar, Consultant; Adrienne McManus, Consultant; Rocio Schmunis, Operations Officer; and Gabrielle Williams, Consultant.

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Reviewers

This report has been reviewed in draft form by the following individuals chosen for their diverse perspectives and technical expertise:

David Barash, GE Foundation

Beth Cameron, Nuclear Threat Initiative

Ashish Jha, Harvard University

Rebecca Katz, Georgetown University

Richard Zeckhauser, Harvard University

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The Influenza, 1890

(excerpts)

By Winston Churchill, 1890

Oh how shall I its deeds recount,
Or measure the untold amount
Of ills that it has done?
From China's bright celestial land
E'en to Arabia's thirsty sand
It journeyed with the sun.

O'er miles of bleak Siberia's plains
Where Russian exiles toil in chains
It moved with noiseless tread;
And as it slowly glided by
There followed it across the sky
The spirits of the dead.

The Ural peaks by it were scaled
And every bar and barrier failed
To turn it from its way;
Slowly and surely on it came,
Heralded by its awful fame,
Increasing day by day.

On Moscow's fair and famous town
Where fell the first Napoleon's crown
It made a direful swoop;
The rich, the poor, the high, the low
Alike the various symptoms know,
Alike before it droop.

CONTENTS

Preface	vii
Acknowledgements	x
Acronyms and Abbreviations	xi
Executive Summary.....	1
Introduction	9
Setting the Context.....	13
Identifying Gaps and Estimating Funding Needs	25
Annex to Chapter 3.....	33
Preparing a Financing Proposal, a Compelling Investment Case and a Change Management Strategy	35
Identifying Sources of Finance and Means of Mobilizing/Allocating Funds to Preparedness.....	41
Annex to Chapter 5.....	59
Incentivizing Countries to Prioritize Allocation of Funds to Preparedness.....	61
Conclusion: Health Security in Dollars and Cents	73
Appendix A—Guidance for Planning	75
Appendix B—Integration/Overlap of Action on Antimicrobial Resistance and Health Emergencies Preparedness	77
Appendix C—Regional Loss Estimates of Infectious Disease Outbreaks and Amr	78
Appendix D—Change Management and Investment Case.....	88

PREFACE

Multiple pandemics, numerous outbreaks, thousands of lives lost and billions of dollars of national income wiped out—all since the turn of this century, in barely 17 years—and yet the world’s investments in pandemic preparedness and response remain woefully inadequate. We know by now that the world will see another pandemic in the not-too-distant future; that random mutations occur often enough in microbes that help them survive and adapt; that new pathogens will inevitably find a way to break through our defenses; and that there is the increased potential for intentional or accidental release of a synthesized agent. Every expert commentary and every analysis in recent years tells us that the costs of inaction are immense. And yet, as the havoc caused by the last outbreak turns into a fading memory, we become complacent and relegate the case for investing in preparedness on a back burner, only to bring it to the forefront when the next outbreak occurs. The result is that the world remains scarily vulnerable.

In the wake of Ebola, a number of commissions and panels made recommendations about how the world could be better prepared to prevent, identify, contain, and respond to infectious disease outbreaks. All these reviews—including the one I chaired for the U.S. National Academy of Medicine—agreed on three key priorities: strengthening preparedness at a national level; improving coordination and capabilities at a regional and global level; and accelerating R&D in this arena. Over the last twelve months we have seen some important steps taken, such as the creation of the Health Emergencies Program at the World Health Organization (WHO), the launch of the Coalition for Epidemic Preparedness Innovations (CEPI), and the establishment of the World Bank’s Pandemic Emergency Financing Facility (PEF). Many countries have signed up for external evaluations of their preparedness and response systems, signaling a welcome openness and willingness to collectively identify problem areas and explore solutions. Yet this also presents a challenge. Countries that develop detailed plans to reinforce their disease surveillance, diagnostic services, infection control, emergency preparedness, etc. in the wake of these assessments will become rapidly disillusioned if there is no money available to translate these plans into reality.

Any individual or government that has had direct experience of an epidemic or pandemic does not need convincing of the case for investing in pandemic preparedness. The cruel statistic of lives lost is only the first measure of impact. To that must be added the cost to the broader economy and to society as a whole. Pandemics cause enormous economic disruption and can quickly undermine communities and governance. Responding to outbreaks once they have happened is far more expensive—in lives and money—than investing in preparedness.

Yet in many countries the argument has not been won. Governments struggle to reconcile limited resources with many competing priorities. Health does not always rank as one of the top budget priorities, and within health spending, pandemic preparedness is often overlooked in favor of more immediate and visible goals.

To address this challenge, an International Working Group on Financing Preparedness was created in November 2016. This Group, which I chair, comprises experts and leaders from multilateral organizations, academia, philanthropic institutions, governments and businesses. The objective of the International Working Group is to propose ways in which national governments and development partners can ensure adequate and sustainable financing for actions to strengthen pandemic preparedness and thus enable effective compliance with the International Health Regulations (IHR) as well as World Organisation for Animal Health (OIE) standards. Our primary focus is on the prevention, identification, and containment of infectious disease outbreaks, so we have concentrated on the financing of critical capacities such as disease surveillance systems, laboratory networks, and emergency operations centers, as well as “One Health” initiatives designed to protect people from pathogens in the animal population. We also recognize the crucial importance of supporting health systems strengthening as a key investment in preparedness.

For many countries, the starting point in assessing what needs to be financed will be the results of a Joint External Evaluation (JEE) or outcome of a Performance of Veterinary Services (PVS) pathway analysis. The recently introduced JEE process is a huge step forward. It provides a systematic and objective assessment of a country’s capabilities across core domains, plus a prioritized list of gaps to be addressed. But of course, a good diagnostic is only the first step. We want the outcomes of these evaluations to be translated into adequately funded action plans that countries can implement. And it is crucial that the financing is sustained: investing in preparedness is not a one-off, but an ongoing requirement.

The scope of our investigation includes domestic resource mobilization, development assistance, and private sector engagement. For many countries, financing preparedness through the domestic public sector budget is the best way to ensure sustained funding and seamless integration with the rest of the health system. Yet this requires ensuring sufficient priority is attached to investing in pandemic preparedness in budget allocations. In some cases, it may also require enhancing fiscal mobilization or attracting direct financing from the private sector. For many countries, especially the poorest and most fragile, there is clearly a role for international development assistance in reinforcing pandemic preparedness. Here, the challenge is to ensure such contributions are effectively coordinated and prioritized, and that we transition to a sustainable funding arrangement, rather than something that withers when donor priorities change.

Ensuring sustained commitment to financing preparedness will be difficult, since the mark of success is that nothing happens, and there will always be multiple competing priorities. In this context, we need to harness the powerful incentives that business and the financial markets can provide. We want investors and business leaders to be taking account of health risks as they decide where to invest and trade. This will reward those countries

that have translated their JEE and PVS assessments into implemented action plans, and expose those countries which have failed to act. Through developing indices that measure intrinsic risk, state of preparedness, and economic vulnerability, we can make the threat of infectious disease outbreaks much more visible and concrete. This in turn will incentivize governments and the private sector to mitigate these risks.

Investing in health security through financing preparedness is a highly cost-effective way to protect lives and safeguard livelihoods and communities. Whether measured in human lives saved or economic disruption avoided, the return on investments in pandemic preparedness is extraordinarily high. Moreover, many of the capabilities and much of the infrastructure required for pandemic preparedness also support efforts to fight endemic diseases and counter the threat of antimicrobial resistance. Taken together, the recommendations of the International Working Group set out in this report represent a pathway towards achieving the goal of universal health security, whilst strengthening health systems and helping ensure delivery of the Sustainable Development Goals.

Peter Sands, Chair

International Working Group on Financing Preparedness

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ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
AMR	Antimicrobial Resistance
APSED	Asia Pacific Strategy for Emerging Diseases
ARC	African Risk Capacity
BMGF	Bill & Melinda Gates Foundation
BSL	Biosafety Level
CARICOM	Caribbean Community
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CDC	Centers for Disease Control and Prevention
CEPI	Coalition for Epidemic Preparedness Innovations
CPIA	Country Policy and Institutional Assessment
CPF	Country Partnership Framework
CPR	Country Performance Rating
CRA	Credit Rating Agency
CRS	Creditor Reporting Survey
CSR	Corporate Social Responsibility
DAC	Development Assistance Committee
DRC	Democratic Republic of Congo
DRM	Domestic Resource Mobilization
FAO	Food and Agricultural Organization of the United Nations
FDIC	Federal Deposit Insurance Corporation
GDP	Gross Domestic Product
GHS	Global Health Security
GHSA	Global Health Security Agenda
GIZ	Gesellschaft für Internationale Zusammenarbeit
GNI	Gross National Income
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
HSFAT	Health Security Financing Assessment Tool
HSS	Health System Strengthening
IADI	International Association of Deposit Insurers
IBRD	International Bank of Reconstruction and Development
IDA	International Development Association
IDC	Infectious Disease Crisis
IDSR	Integrated Disease Surveillance and Response
IHR	International Health Regulations
IHR-MEF	International Health Regulations—Monitoring and Evaluation Framework

IMF	International Monetary Fund
IPC	Infection Prevention and Control
IPCC	Intergovernmental Panel on Climate Change
IRAI	IDA Resource Allocation Index
IWG	International Working Group on Financing Preparedness
JEE	Joint External Evaluation
JICA	Japan International Cooperation Agency
LSHTM	London School of Hygiene and Tropical Medicine
MERS	Middle East Respiratory Syndrome
NAM	National Academy of Medicine
NAPHS	National Action Plan for Health Security
ODA	Overseas Development Assistance
OECD	Organization for Economic Co-operation and Development
OIE	World Organization for Animal Health
PAHO	Pan American Health Organization
PEF	Pandemic Emergency Financing Facility
PHE	Public Health and Environment
PHEIC	Public Health Emergency of International Concern
PPR	Portfolio Performance Rating
PSRT	Private Sector Roundtable
PVS	Performance of Veterinary Services
R&D	Research and Development
REDISSE	Regional Disease Surveillance Systems Enhancement
S&P	Standard & Poor's
SARS	Severe Acute Respiratory Syndrome
SCD	Systematic Country Diagnostics
SDG	Sustainable Development Goals
SICA	Central American Integration System
TB	Tuberculosis
UHC	Universal Health Coverage
UK	United Kingdom
UNDP	United Nations Development Programme
UNISDR	International Strategy for Disaster Reduction
US	United States
USAID	United States Agency for International Development
VRAM	Vulnerability, Risk Assessment and Mapping
WBG	World Bank Group
WEF	World Economic Forum
WHA	World Health Assembly
WHO	World Health Organization

EXECUTIVE SUMMARY

Deadly infectious pandemics will mark humanity's future, as they have shaped its past. Neither individual governments nor the global community can entirely prevent the emergence of infectious threats. But we can be much better prepared.

This report by the International Working Group on Financing Preparedness (IWG) proposes ways in which national governments and development partners can finance investments in country and regional preparedness and response capacities for pandemics and other health emergencies.

Preparedness for pandemics refers to health and non-health interventions, capabilities, and capacities at community, country, regional, and global levels. Their purpose is to prevent, detect, contain and respond to the spread of disease and other hazards, mitigating social disruptions and limiting risks to international travel and trade.

The Case for Preparedness

Pandemics cause vast human suffering and devastating economic costs. Experts differ in their estimates of the economic cost of pandemics and the closely related threat of drug-resistant infections. However, all the figures advanced are alarmingly high. Even the most conservative estimates suggest that a pandemic could destroy over 1.0 percent of global GDP, comparable to other global threats such as climate change. Even much smaller outbreaks can cause significant loss of life and immense economic disruption. Investments improving preparedness therefore offer an extraordinarily high potential return. Yet we invest relatively little in mitigating the risks of infectious disease crises relative to

what we spend against other risks to human lives and livelihoods, such as climate change, war or financial crises.

In countries where there is a reasonably comprehensive and well-functioning underlying health system, which would include a number of low-income and many middle-income countries, financing improved preparedness might cost less than \$1 per person per year, not a huge sum compared to the scale of the risks to human lives and livelihoods. More advanced economies can and do choose to spend much more per person. Achieving improved preparedness in countries with fundamental gaps in health coverage and capacities, particularly in primary care, will cost more, since preparedness is built on these foundations.

In addition to mitigating the risks to human lives and livelihoods from infectious disease risks, investing in preparedness has important benefits for the broader health system. Many of the capabilities and infrastructure required for preparedness are also needed to combat antimicrobial resistance and endemic infectious diseases.

The Goal of Preparedness: Universal Health Security

The concept of universal health security best captures the ultimate purpose of reinforcing preparedness. At its simplest, health security means protecting people from threats to their health. Universal health security means protecting everybody, not just because that is the equitable thing to do, but because with infectious diseases, true health security can only be achieved if everyone is protected.

Achieving universal health security is an essential component of the ultimate goal of providing universal health coverage. It both depends on and complements broader efforts to strengthen health systems and make them more resilient, so needs to be pursued as part of an integrated plan, not as a separate silo. When an infectious disease outbreak occurs, health systems come under enormous pressure, and other health objectives are often compromised, as resources are diverted to contain the outbreak and patients avoid seeking care. Better preparedness is key to making health systems more resilient.

Achieving Universal Health Security

In this report, we set out 12 specific recommendations to ensure adequate and sustained financing of preparedness. The recommendations are integrated and interdependent. Together they constitute a unified framework. To be effective in achieving universal health security, we need to pursue them all.

RECOMMENDATION 1: National governments and development partners should commit to a path towards universal health security by adopting and implementing the framework set out in this report and embodied in Recommendations 2–12.

Identifying Gaps and Developing a Plan

The first step for countries seeking to strengthen their preparedness is to make an accurate assessment of their current state of preparedness and thus to identify gaps and resource needs. The Joint External Evaluation mechanism (JEE), launched in 2016 by the World Health Organization (WHO), provides an effective mechanism for conducting such an assessment. Through a combination of peer review and self-assessment, the JEE delivers a systematic

evaluation of a country's preparedness capabilities and infrastructure across 19 domains, enabling clear identification of gaps and areas for improvement. The World Organisation for Animal Health (OIE) also has a well-established equivalent evaluation mechanism, the Performance of Veterinary Services Pathway (PVS), which assesses the quality of national veterinary services and animal health systems. Together, the JEE and the PVS provide national governments with the essential starting point for any initiative to improve preparedness: a detailed and objective assessment of the current status against agreed benchmarks.

RECOMMENDATION 2: (i) By the end of 2017, all national governments should commit to participate in, and by the end of 2019, conduct a Joint External Evaluation (JEE) to assess their capacity to comply with the requirements of the International Health Regulations 2005 (IHR) to prevent, detect, and rapidly respond to public health threats; (ii) By the end of 2017, all national governments should commit to participate in, and by the end of 2019, conduct an evaluation of Performance of Veterinary Services (PVS) to assess their capacity to comply with the World Organization for Animal Health (OIE) standards.

Following the JEE and PVS assessments, the next step is for countries to develop a prioritized plan to rectify gaps and remedy weaknesses. To support countries in this effort, WHO has developed Guidelines for Development of a National Action Plan for Health Security (NAPHS). The Guidelines outline steps for situation analysis, strategic planning and prioritization, costing, budget allocation and implementation of the NAPHS. As of the end of April 2017, three countries—Tanzania, Pakistan and Eritrea—had completed the crucial costing phase of their preparedness plans.

For many countries, particularly smaller or island nations, the plan may involve extensive regional cooperation. Infectious diseases do not respect national boundaries. Cooperation and the

sharing of specialist facilities can deliver better preparedness and be more cost effective.

RECOMMENDATION 3: Within nine months of completion of JEE and PVS, national governments should develop and publish a prioritized and costed plan to implement recommendations emerging from the JEE and PVS assessments, including regional elements where relevant.

Devising a Financing Proposal, Building a Compelling Investment Case and Creating a Change Management Strategy

Once a country has developed a costed and prioritized plan, the next steps are to work out how to finance this plan and then how to implement it effectively. This requires: first, a robust and realistic financing proposal to ensure inclusion in domestic budgets and where relevant, to attract donor support; second, a compelling investment case, that ensures sustained economic and political support for improving preparedness; and finally, a change management strategy that ensures the committed engagement of relevant stakeholders. Reinforcing preparedness is not a quick fix: it is a complex multi-stakeholder process that stretches well beyond the ministry of health and can often entail far-reaching changes in established attitudes, practices, and institutions.

To support national governments in translating costed and prioritized plans into detailed financing proposals the World Bank is developing the Health Security Financing Assessment Tool (HSFAT), which is designed to complement the JEE and PVS assessment mechanism.

RECOMMENDATION 4: Depending on the national budget cycle, but ideally within three months of developing a prioritized and costed plan following JEE and PVS assessments, national

governments should prepare a detailed financing proposal to support implementation of the plan to improve preparedness.

A prioritized and costed plan, plus a detailed financing proposal are essential prerequisites for effective action to improve preparedness. Yet experience suggests these alone are not enough. To catalyze the commitment of resources to deliver the plan, its proponents in each country need broad political and social support. To win such support requires a compelling investment case that articulates the political and economic arguments for reinforcing preparedness in the context of each individual country. Furthermore, ensuring effective delivery of the plan requires an integrated change management strategy that engages and coordinates relevant stakeholders.

RECOMMENDATION 5: Each national government should develop an investment case, articulating the political and economic arguments for integrating the costed plan into national budget cycles and committing resources to reinforce and sustain preparedness, plus a change management strategy to engage and coordinate relevant stakeholders.

Identifying and Mobilizing Sustainable Financing for Preparedness

Rigorous planning, a compelling investment case and convincing implementation strategy are indispensable, but will achieve little unless adequate funds can actually be identified and deployed. In many countries, this will be achieved through giving greater priority to funding preparedness within existing budgets. But in other countries, it may be necessary to explore ways to increase fiscal space.

For most countries, the optimal source of finance for preparedness is the domestic budget, which

is the best way to ensure sustainable financing of a public good like preparedness and to facilitate seamless integration with broader efforts to strengthen the health system and extend coverage. However, in many low-income countries, the challenge will be inadequate domestic resource mobilization. Weaknesses in tax design and collection mean inadequate resources against a huge number of competing priorities. As preparedness rarely ranks high on the list of priorities, weak domestic resource mobilization leads to sustained underinvestment in preparedness.

Yet there is considerable potential to increase tax revenues in most developing countries. Through sustained focus on improving tax capabilities, many low-income countries could raise their tax ratios by 2–4 percent of GDP, with significant potential benefits for multiple aspects of social and economic development, including preparedness (IMF 2011). Most of this can be achieved through improving the effectiveness of the overall taxation system. However, earmarked taxes may also have a role to play, given the fact that people are often more prepared to pay taxes for health than for other government activities. While there is considerable debate about the longer-term effectiveness of earmarked taxes, countries should consider their introduction where they might prove an effective way to generate additional fiscal space for preparedness.

RECOMMENDATION 6: To increase fiscal space, national governments should examine ways of generating incremental domestic resources to finance preparedness, whether by (i) improving overall tax design and collection; or (ii) introducing earmarked taxes where they might be an effective way to generate additional resources.

For some lower income countries, development assistance will play an important role in financing better preparedness. Many advanced economies have made significant collective and individual commitments to providing development

assistance for reinforcing preparedness, such as the G7 commitment to support 76 countries or the World Bank's to support at least 25, and it is important that such commitments are fulfilled. Given the scale of the risks to mankind as a whole and the global economy, there is a strong self-interest argument for richer countries to deploy development funds for investing in universal health security. To maximize the catalytic impact of such development assistance, development partners should prioritize three categories of financial support:

Financing capital investments or one-off expenditures to achieve a step change in preparedness capacities in poorer countries. These might include laboratories or specialized training. Wherever possible, beneficiary countries should then take on the financing of ongoing recurrent expenditure.

Financing regional initiatives. Regional laboratory facilities and cross-border disease surveillance systems should be important components of many smaller countries' plans to reinforce preparedness. Yet gaining agreement between countries on how to finance such shared capacities may impede their implementation. Here development assistance can play a critical role.

Financing the creation of baseline preparedness and prevention capacities in fragile and conflict-affected states, where domestic resourcing is an unrealistic aspiration and there are significant gaps in the underlying health system.

In all cases, development should seek to support the financing of preparedness through the national health security plans and budgets emanating from the JEE process, and use the JEE criteria as benchmarks of achievement. Wherever possible development partners should seek to secure commitments from recipient governments around matching and ongoing funding so as to maximize the impact of the development assistance.

RECOMMENDATION 7: Development partners should fulfill and build on existing collective and bilateral commitments to help finance preparedness in countries needing support, focusing on: (i) in-country capital investments and one-off spends; (ii) multi-country regional initiatives; and (iii) failed and fragile states where domestic resourcing is not a realistic option. To maximize the catalytic impact of their assistance, development partners should structure their support to the health security plans emanating from the JEE process and encourage national governments to match investments and commit to ongoing financing from domestic resources.

Engaging the Private Sector in Reinforcing and Financing Preparedness

Private-sector companies have much to lose from disease outbreaks, but are often only marginally involved in the implementation of initiatives to reinforce preparedness and response and typically make little direct financial contribution to preparedness. This must change.

There are a variety of possible ways to engage the private sector more effectively, though none is a “silver bullet.” First, it is important to build much greater awareness of the risks of infectious disease outbreaks amongst private sector leaders. In addition to stimulating companies to improve their own internal preparedness, such awareness-building should make business leaders less resistant to taxes or regulations related to reinforcing pandemic prevention and response and more inclined to work with governments to mitigate the risks. Second, governments should seek to involve the private sector in plans to reinforce preparedness and response, leveraging relevant private sector assets and capabilities. Third, where private sector companies contribute to the risks of infectious diseases as a result of their business activities, such as livestock production, governments

should introduce regulations to require appropriate investment in risk mitigation and preparedness. Governments may also want to consider encouraging or even mandating corporate social responsibility (CSR) spending on preparedness.

RECOMMENDATION 8: National governments should incorporate the private sector into their strategy for reinforcing preparedness, through a combination of awareness-building, direct involvement in preparedness and response planning, and regulation. Where private sector companies contribute directly or indirectly to the risks of disease outbreak and spread by the nature of their business, national governments should introduce regulations requiring such companies to invest in risk mitigation and preparedness.

Leveraging Insurance to Finance Response and Incentivize Preparedness

As has been demonstrated in the earthquake and drought contexts, insurance can play an important role in ensuring rapid disbursement of funds to finance disaster response, and in creating incentives for investing in risk mitigation and preparedness.

To pioneer the deployment of insurance mechanisms in the infectious disease arena, the World Bank, and other partners developed the Pandemic Emergency Financing Facility (PEF), a parametric insurance vehicle designed to provide rapid disbursement of emergency finance. The PEF covers a range of diseases and is focused on countries that are part of the International Development Association (IDA), with the premiums funded by donor nations. Through this initiative, the World Bank and its partners have worked through numerous challenges and technical issues associated with utilizing innovative insurance mechanisms for pandemic response. There is an opportunity to

build on this experience to develop a “PEF 2.0”, and to encourage the development of insurance products for the private sector. While rapid disbursement of funds in response is a real benefit, the greater prize from introducing insurance mechanisms for both governments and the private sector are the incentives insurance creates for investment in preparedness. This will require the development of much broader markets, which will inevitably take time.

RECOMMENDATION 9: The Insurance Development Forum, the World Bank, and other partners should work together to: (i) develop the next iteration of the Pandemic Emergency Financing Facility (PEF 2.0) that specifically ties recipient countries’ investments in preparedness to relief of their contributions to PEF 2.0 premiums; (ii) deliver maximum participation from the insurance markets to provide capacity for PEF 2.0; and (iii) investigate how insurance for business interruption resulting from disease outbreaks can be provided to private sector companies in target countries.

Incentivizing Countries to Invest in Preparedness

We will only achieve a substantial reduction in the risks to human lives and livelihoods across the globe from infectious disease outbreaks if individual countries commit to investing in national preparedness. For this to happen, governments need to be convinced that investing in public health systems is absolutely necessary despite the multitude of competing demands for scarce budget resources. The current under-preparedness of many countries indicates that this case has not been convincingly made.

One approach is to ensure that plans and financing proposals for improving preparedness are underpinned by a more compellingly articulated investment case. That is the logic of Recommendation 5.

Yet this alone is not enough. The most powerful way to reinforce the investment case and create more direct incentives for investment in preparedness is to ensure that the risks attaching to infectious disease outbreaks are reflected in financial markets and businesses’ investment decisions. Another complementary approach would be to use measures of preparedness to influence the flows of development assistance, such as concessional financing from the World Bank.








If a country’s economic vulnerability to infectious disease outbreaks was incorporated in mainstream macroeconomic analyses, bond ratings and investment criteria, investment in pandemic preparedness would no longer be solely the concern of the Health Minister. Encouraging the development of metrics around intrinsic risk, state of preparedness and sectoral vulnerability would change the way such decisions are made. This could be achieved through official initiatives, academic efforts or private endeavors, or through creative partnerships (perhaps along the lines of UNDP’s partnership with S&P to include the Human Development Index (HDI) in devising sovereign ratings). Inclusion of infectious disease risks in the IMF’s Article IV consultations, in situations where such risks are considered macro-critical, would have a powerful signaling effect.

RECOMMENDATION 10: To reinforce incentives for national governments to invest in preparedness, the IMF and World Bank should work to facilitate the incorporation of the economic risks of infectious disease outbreaks into macroeconomic and market assessments, including: (i) inclusion into Article IV assessments where such risks are macro-critical; (ii) encouraging the development of academic and private sector indices and maps of intrinsic risk, preparedness and economic vulnerability.





Countries are also likely to pay more attention to investing in preparedness if doing so increases access to concessional international finance.

Tackling Pandemic Preparedness—Roles and Responsibilities



All countries should:

-  Commit to strengthen universal health security
-  Assess their IHR core capacities and performance of veterinary services by conducting JEE and PVS by end 2019
-  Develop a prioritized and costed plan within 9 months of completion of gap assessment
-  Prepare a financing proposal within 3 months of completing a prioritized and costed plan
-  Engage and coordinate relevant stakeholders and develop a country-specific investment case
-  Examine ways of generating resources for preparedness from taxes
-  Regulate private sector investment in preparedness

International development partners should:

-  Commit to strengthen universal health security
-  Commit support to finance preparedness activities and catalyze domestic resource mobilization
-  Leverage insurance models to support response and recovery, including the PEF2.0
-  Facilitate incorporation of economic risk for infectious disease outbreaks into macroeconomic and market assessments

World Bank should:

-  Include preparedness indicators in the CPIA tool & IDA loan allocations
-  Include preparedness indicators in the country-specific systemic country diagnostics

One way of achieving this is by introducing an assessment of preparedness as a criterion in the Country Policy and Institutional Assessment (CPIA) tool that the World Bank uses to determine the country allocation of IDA resources.

Introducing an assessment of pandemic preparedness would have two benefits. First, the fact that countries are being assessed on pandemic preparedness will raise its visibility, profile and importance. Second, countries that do well on this assessment will be able to increase their allocations of concessional finance through IDA.

RECOMMENDATION 11: The World Bank should include assessment of pandemic preparedness capacity in the Country Policy and Institutional Assessment (CPIA) tool and include the rating in the overall country score used as part of the IDA allocation formula. Other multilateral development banks should consider introducing equivalent mechanisms to incentivize investment in preparedness.

In 2013, the World Bank adopted a new strategy focused on aligning the institutions work with the twin goals of ending extreme poverty and boosting shared prosperity in a sustained manner. The World Bank introduced a diagnostic exercise, called the Systematic Country Diagnostics (SCD), to identify key challenges and opportunities for a country to accelerate progress towards development objectives consistent with the twin goals. This diagnostic is a reference point for World Bank Group client consultations with countries. Incorporating an assessment of a country's pandemic preparedness in the Bank's SCD will emphasize the importance of preparedness and give the issue greater visibility in the eyes of policy makers. Further, it will help countries make a strong case for concessional Bank finance in support of investments in pandemic preparedness.

RECOMMENDATION 12: The World Bank should incorporate analysis of pandemic preparedness in country-specific Systematic Country

Diagnostics that identify a set of priorities through which a country may most effectively and sustainably achieve the poverty reduction and shared prosperity goals.

For far too long, our approach to pandemics has been one of panic and neglect: throwing money and resources at the problem when a serious outbreak occurs; then neglecting to fund preparedness when the news headlines move on. The result has been too many lives lost, too much damage to human livelihoods. As recent news of a new Ebola outbreak demonstrates (May 2017), the threat of deadly pathogens is ever present. New outbreaks will occur, but by investing in prevention, detection, containment and response we can reduce their frequency and impact. Investing in global health security is an imperative. Otherwise we will all too often see poorer, more vulnerable countries suffering terrible loss of life and being knocked off their trajectory of social and economic development. And we put the world as a whole at risk of some highly contagious deadly influenza or other virus that could kill millions and wipe trillions from the global economy.

Strengthening preparedness at a national level reinforces our first line of defense against the threat of pandemics. It is not the whole answer: we also need to strengthen capabilities and coordination at a global level; and we must accelerate research and development to give us more scientific weapons to fight infectious pathogens. Yet unless we can prevent, detect, contain and respond at a local level we will always be on the back foot.

Building and maintaining preparedness requires sustained financing. The absolute sums are not large relative to the scale of the risk, but thus far many governments and development partners have failed to give preparedness the priority it merits. We must demonstrate the power of the investment case. We must secure commitments to sustained financing and monitor that these are delivered. Only then can we be confident that we have made the world a safer place, that we are on the path towards achieving universal health security.

1

INTRODUCTION

The Preparedness Problem

In the wake of the Ebola crisis that began in West Africa in 2013, a series of reports have recommended strengthening and scaling up investments in global health security as an urgent priority. Expert assessments by the Harvard-London School of Hygiene and Tropical Medicine (LSHTM) Independent Panel on the Global Response to Ebola (November 2015), the U.S. National Academy of Medicine's (NAM) Commission on Creating a Global Health Risk Framework for the Future (January 2016), and the UN High Level Panel on the Global Response to Health Crises (February 2016) urge far-reaching improvements in nations' public health capabilities and infrastructure, in international leadership for preparedness and response, and in research and development related to infectious diseases.

Emphasizing the urgent need to invest in preparedness, the Harvard-LSHTM Panel called upon the global community and countries to agree on a clear strategy to ensure that governments invest domestically in building core public health and system capacities, and to mobilize adequate external support to supplement these efforts, especially in poorer countries. Highlighting infectious diseases as one of the biggest risks facing humankind, the NAM Commission on Creating a Global Health Risk Framework for the Future argued that reinforcing public health capabilities should be a top priority and estimates that \$4.5 billion must be spent annually to prepare the world for the next

global health crisis, whether it is a resurgence of Ebola, SARS, or bird flu, a swiftly moving threat like Zika, or some entirely new disease. Stressing the need for all countries to meet the full obligations of the International Health Regulations 2005 (IHR), the UN High Level Panel noted that building a global health architecture that is better prepared to respond to health crises will require additional financial resources, and stresses the need to mobilize domestic and international funding, especially for low-income countries, to support the implementation of the IHR's Core Capacity requirements.

The International Working Group

In response to these calls for increased investment in preparedness, the International Working Group on Financing Preparedness (IWG) was established at the World Bank in November 2016. Comprising 17 experts and leaders from multilateral organizations, academia, philanthropic institutions, government, and businesses, the IWG proposes ways in which national governments and development partners can effectively and sustainably finance investments to strengthen country and regional preparedness and response capacities for health emergencies. These capacities include disease surveillance, diagnostic laboratories, field epidemiology, infection control, and emergency planning. They are set out in the IHR, the 11 action packages of the Global Health Security Agenda (GHSA),

the 19 action areas of WHO's Joint External Evaluation (JEE), and the performance of veterinary services as measured by the 4 areas of OIE PVS.

The IWG has focused on developing the business case for increasing investment in preparedness and response; identifying approaches to prioritize investments in country-level preparedness within existing national budgets; suggesting options for incremental domestic resource mobilization for funding preparedness and response from both the public and private sectors; and identifying how development financing for health can be used to catalyze and support domestic investments in preparedness in countries requiring assistance. Our report sets out an overall timetable for financing this agenda against which countries and the international community can hold themselves accountable.

Because the IWG is primarily concerned with the challenges of financing preparedness at the country level, many topics lie outside our scope. Our analysis does not address funding for global capabilities and coordination, such as the WHO itself. Nor do we discuss the financing of accelerated research and development for either infectious diseases or antimicrobial resistance. These latter issues are being addressed through initiatives such as the Coalition for Emergency Preparedness Innovations (CEPI).

How We Worked

The IWG's work was spread over three phases: a *preparatory phase*, during which we established what data existed, took stock of work done already, and identified selected individuals and organizations for further cooperation; an *analytical phase*, during which we conducted data analysis, established patterns and relationships in the data and addressed the group's mandate through the synthesis of numerical and narrative data; and a

compilation of recommendations phase, which marked the culmination of the first two phases and during which members considered the various emerging options and settled upon the recommendations contained in this report. The IWG held two face-to-face full membership meetings and a series of theme-specific discussions over its six-month tenure. Members used these meetings to share ideas, examine evidence, test hypotheses and form recommendations.

The recommendations of the IWG are expected to inform the implementation of the financing-related recommendations of the various panels, provide input to the Global Health Crises Task Force (established by the UN Secretary-General to monitor implementation of recommendations of the UN High Level Panel), and contribute to the development of a financing framework to assist in the implementation following an external evaluation.

Review Process

This report has been reviewed in draft form by individuals identified for their expertise, experience and perspectives. Comments and suggestions from the peer reviewers were received in writing and in discussions, and have been addressed in the final report. The report has not been modified or amended in any substantive manner (other than minor editorial corrections) after the completion of the review process.

Overview of the Report

The remainder of this report is organized as follows. Chapter 2 summarizes the case for investing in pandemic preparedness. Chapter 3 looks at how countries can identify the gaps in their pandemic defenses, assess resource needs, and develop an action plan. Chapter 4 discusses the importance of preparing a robust financing proposal, compelling investment

case and an overarching change management strategy. Chapter 5 focuses on ways in which countries can mobilize additional resources for preparedness, both domestically as well as through external assistance. Chapter 6 examines measures which can potentially

incentivize countries to give greater importance to financing preparedness. The report concludes in Chapter 7, which also contains a list of actions that countries and development partners must take to sustainably finance preparedness.

2

SETTING THE CONTEXT

The Case for Investing in Pandemic Preparedness

The health, economic and social impacts of disease outbreaks are substantial (Exhibit 2.1). Measured in terms of human suffering or economic disruption, pandemics exact huge costs. The human tragedy of rapidly spreading infections has scarred the new century repeatedly.

The recent Zika outbreak in the Americas infected over a million people. It is associated with 2,971 confirmed cases of microcephaly, a congenital syndrome in which children of infected mothers are born with small heads and brain damage (PAHO 2017). Between December

EXHIBIT 2.1 The Burden of Large Epidemics

The infographic is divided into three horizontal sections, each with a distinct icon and a list of impacts. The top section, 'Health impact', features a heart with a pulse line icon and lists sickness, deaths, and long-term sequelae. The middle section, 'Economic impact', features a dollar sign with a circular arrow icon and lists productivity loss, absenteeism, and response costs. The bottom section, 'Social impact', features a hand holding people icon and lists social fabric disruption and equity issues.

- Health impact**
 - Sickness
 - Deaths
 - People left with long-term sequelae
- Economic impact**
 - Productivity loss from death or disability of affected population
 - Productivity loss of caregivers
 - In most severe outbreaks
 - Loss from travel/transport bans (e.g. tourism, business travel, exports)
 - Loss of consumer confidence and spend
 - In most severe outbreaks (cont'd)
 - Absenteeism and closure of schools
 - Cost of response & recovery
- Social impact**
 - Disruption of social fabric
 - Children/dependents left without caregivers, disruption of households
 - Need for more caregivers due to disability
 - Social stigma
 - Equity/access
 - Women & children disproportionately affected
 - Poorest population disproportionately affected

2013 and April 2016, the largest epidemic of Ebola virus disease to date generated more than 28,616 cases and 11,310 deaths in Guinea, Liberia, and Sierra Leone (CDC 2016). The 2009 H1N1 influenza resulted in over 18,000 deaths (WHO 2010). MERS has taken 690 lives so far (WHO 2017). Early in the new millennium, SARS killed 774 among the 8,098 people infected (WHO 2003).

In infectious disease outbreaks, it's the health sector that often gets hit the hardest as the sick people who come to the healthcare sector infect healthcare workers. The recent Ebola outbreak claimed the lives of 518 medical staff out of a total of 898 infected (The Economist 2016). Sierra Leone lost 221 healthcare workers, followed by Liberia (192) and Guinea (100). The effect is doubly pronounced when the health sector itself is weak. Sierra Leone, for example, spends under \$300 per person per year on health at purchasing power parity, one-tenth of most countries in Europe. Guinea has 10 doctors per 100,000 people, one-twentieth of most countries in Europe. One of the key failures during the Ebola outbreak was that people did not want to seek formal care because the system itself was bad—so they stayed at home and got others in their family sick. By the time they went to a doctor they were already very ill, and did not survive long. Restoring confidence in the health system, therefore, needs investments to strengthen capacity to care for sick people during outbreaks.

Investments in pandemic preparedness have huge co-benefits for the healthcare sector. Investments in surveillance and diagnostic capacities, for instance, can be used for routine care of patients. This synergistic relationship between investing in pandemic preparedness and investing in health systems reinforces the argument for committing resources to strengthening public health capabilities, which otherwise tend to get overlooked in favor of investments that yield a more immediate and visible return.

A Threat to Economies

The high death count and social disruption are not the only costs associated with pandemics; the financial and economic damages are also devastating. Ebola wiped out many of the recent development gains in Guinea, Liberia, and Sierra Leone, which had been among the fastest growing economies in the world prior to the crisis. The disease slashed investment and caused a substantial loss in private-sector growth; unleashed threats to food security through declining agricultural production; and burdened cross-border trade with restrictions on movement, goods, and services. The World Bank estimates that as a result the three countries lost \$2.2 billion in GDP in 2015 alone (World Bank 2015).

Several other estimates of the projected economic impact of infectious disease crises bolster the case for global action on preparedness. A National Academy of Medicine report from 2016 uses estimated probabilities of a mild, moderate, and severe pandemic, and their expected economic costs, to produce an annualized loss estimate of \$60 billion. Fan, Jamison and Summers (2015) offer a somewhat higher estimate of expected annual income loss (\$80 billion). Incorporating the expected costs associated with mortality, which are not included in the National Academy of Medicine estimates, the expected annual losses rise six-fold to \$490 billion.

While experts have differed in their precise estimates of the cost of pandemics, all the figures are alarmingly high. Even the most conservative estimates (0.1 to 1.0 percent of global GDP) suggest pandemic risks are on par with other high-profile economic threats that concern business leaders and policy makers, such as climate change (0.2 to 2.0 percent of global GDP, according to IPCC 2014) and natural disasters (0.3 to 0.5 percent of global GDP and 65,000 deaths per year, according to UNISDR

2015). Precisely because they are so high, the estimated economic losses from infectious threats underline the significant potential return on investment that will come from improving preparedness.

A Spiral of Fear

The economic impact of disease outbreaks is exacerbated by fear, which makes people modify their behavior to reduce their chance of exposure. The 2015 South Korean MERS outbreak that saw more than 16,000 people quarantined and claimed 38 lives is a case in point. It caused widespread panic and resulted in a substantial change in consumer behavior, with people avoiding restaurants and shopping centers and instead meeting their purchasing needs through online shopping. The entertainment and leisure sectors were the worst hit. According to data from the Korean Film Council, cinema visits dropped by 52 percent year on year in the first two weeks of June. Tourist arrivals fell by 41 percent as many visitors cancelled their plans to visit South Korea. In June 2015, the consumer sentiment index compiled by the Bank of Korea fell below the neutral 100 mark, signifying a deteriorating outlook, for the first time since 2012. Fears that the MERS outbreak would have a dramatically negative impact on private consumption led the Bank of Korea to cut its benchmark policy rate by 25 basis points in June (Economic Intelligence Unit 2015).

Likewise, China, though it was slow to respond at the early stages of the outbreak, did everything it could in 2003 to minimize human-to-human contact as it tried to check the spread of SARS. Despite these efforts, the World Bank estimates that China's GDP contracted by 0.5 percent in 2003 (World Bank 2008), while global GDP fell by \$40 billion (Lee and McKibbin 2004). Recent economic work suggests that the annual global cost of moderately severe to severe pandemics is roughly \$570 billion, or 0.7 percent

of global income (Fan et al 2015). The cost of a severe pandemic like the 1918 influenza pandemic could total as much as 5 percent of global GDP (World Bank 2015).

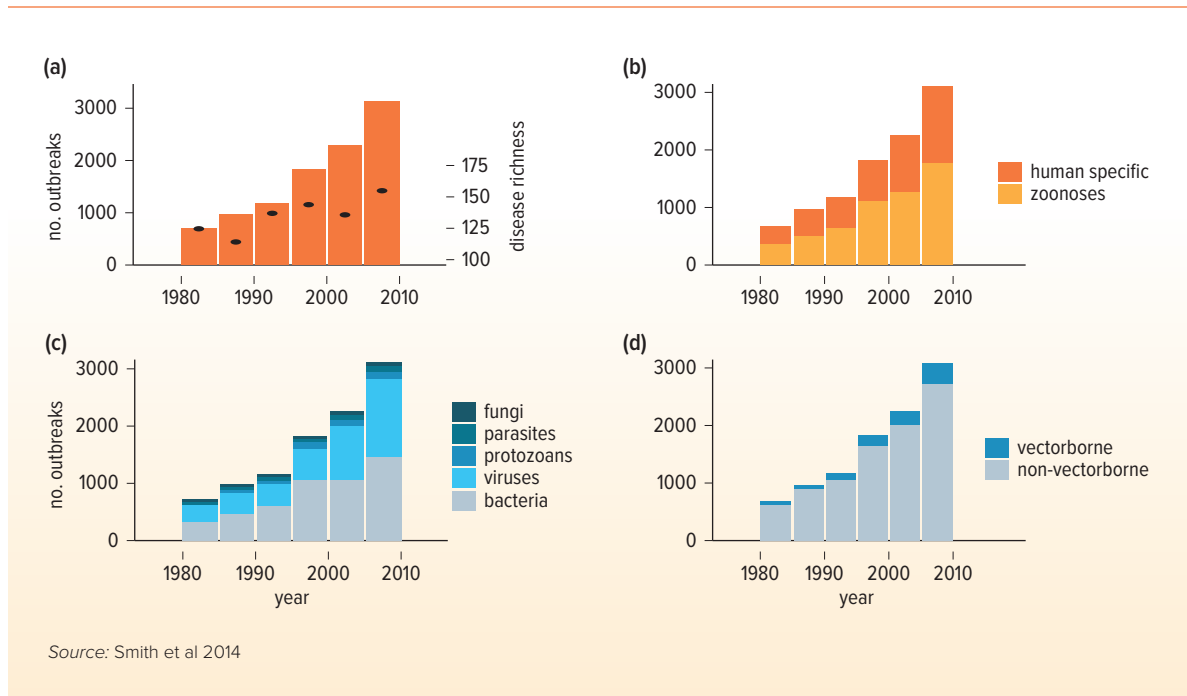
Increasing Frequency of Disease Outbreaks

For many reasons, the frequency and diversity of disease outbreaks have increased steadily since 1980. First, recent advances in travel, trade and connectivity have led to rapid increases in speed and volume not only of humans, animals and commodities, but also of deadly pathogens. Second, there has been unprecedented increase in unplanned urbanization, because of which millions of people live in crowded spaces and unhygienic conditions, which can be perfect breeding grounds for diseases to spread. Third, civil unrest and war displace large volumes of people, who move to new places, carrying with them a variety of infectious disease organisms. And fourth, global warming is creating new belts of warm and moist environments, which are ideal conditions for the spread of disease vectors.

Between 1980 and 2013, 12,012 outbreaks of 215 human infectious diseases have been recorded, comprising more than 44 million cases occurring in 219 nations. In an analysis of this dataset, Smith et al (2014) finds that after controlling for disease surveillance, communications, geography and host availability, it is found that the total number and richness (i.e., number of unique causal diseases) of outbreaks increased significantly since 1980 ($p < 0.0001$).

Exhibit 2.2 plots these outbreaks. Panel (a) depicts the rising trend in total outbreaks and richness of causal diseases over time. Panel (b) presents the same information, but according to host type. Panel (c) shows the pathogen taxonomy, while panel (d) graphs the transmission modes.

EXHIBIT 2.2 Infectious Disease Outbreaks, 1980–2010



Deadly and Unpredictable: The Example of Influenza

The unpredictability of the occurrence of pandemics makes the case for investing in preparedness even more compelling. Influenza pandemics, which kill many people, show no predictable periodicity or pattern—beyond that they seem to occur roughly every 3 or 4 decades (Exhibit 2.3). There is a high probability that the world will experience a severe outbreak in the next 10 to 30 years that could destabilize societies and economies; but it’s anyone’s guess when and where it might emerge.

Fifty million people are believed to have died in the 1918 influenza pandemic, which infected a third of the world’s population. This was in an age before intercontinental air travel and globalization, and at a time when the world’s population was under 2 billion. Two other worldwide influenza outbreaks occurred in the last century, in 1957 (H2N2 Asian flu) and 1968 (H3N2 Hong Kong flu), with death tolls in the 1–3 million

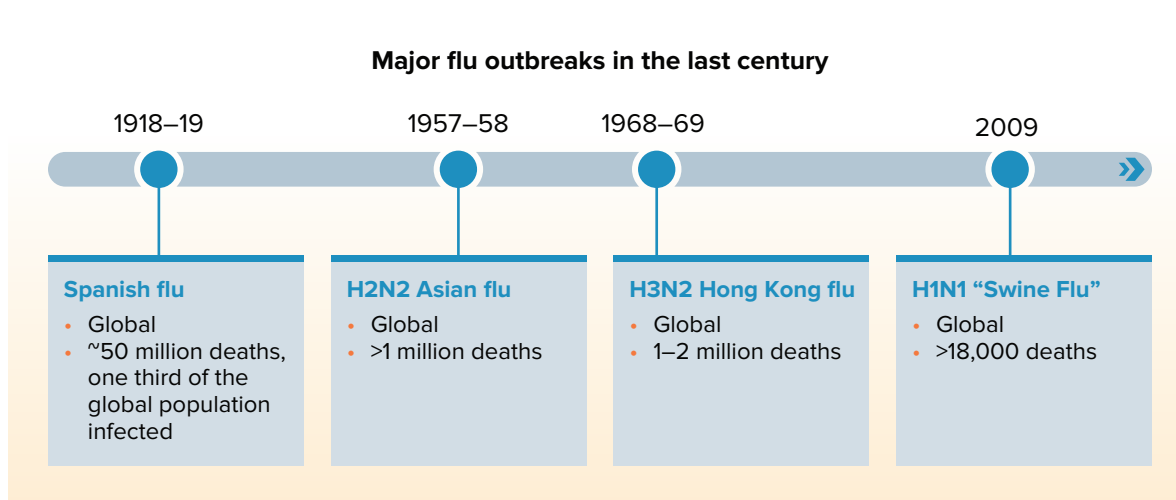
range.¹ These pandemics represented 3 different antigenic subtypes of influenza A virus (H1N1, H2N2, and H3N2 respectively), and differed from each other with respect to etiologic agents, epidemiology, and disease severity.²

The 2009 H1N1 influenza pandemic, the first of the 21st century, showed how a new virus could spread very quickly to every corner of the globe in an era where the concentrations of human populations and their constant global

¹ Not classified as “true” pandemics are 3 notable epidemics: the 1947 H1N1 pseudo-pandemic in Japan and Korea, which recorded low death rates; the 1976 H1N1 epidemic of swine influenza in New Jersey, USA, which caused serially transmitted disease, pneumonia, and death at a military installation, but disappeared within a few weeks; and the 1977 H1N1 Russian flu, which was almost entirely restricted to persons under 25 years of age.

² Not much is known about the antecedents of the virus of 1918 flu, but in the case of 1957 and 1968 pandemics, both of which occurred in the era of modern virology, the hemagglutinin antigen of the causative viruses showed major changes from the corresponding antigens of immediately antecedent strains. This renders prediction difficult, especially since “with 16 known forms of influenza hemagglutinin (the “H” in the strain name), 9 known varieties of neuraminidase enzyme (the “N” in the name), and different subtypes within each type, the potential for new enzymatic combinations—and recombinations—is great.” Harmon K. 2011

EXHIBIT 2.3 Influenza—Moderate and Severe Influenza Pandemics Regularly Hit the Population



movements prevent the local extinction of the virus population.³ The first cases of the novel swine-derived H1N1 influenza A virus were detected in Mexico and the United States in late April 2009, and by the end of the year the virus had spread to 208 countries, resulting in hundreds of thousands of cases and at least 18,000 deaths.

If a pandemic virus equivalent in pathogenicity to the virus of 1918 were to return in the highly inter-connected, globalized, and urbanized 21st century world, it would likely kill more than 100 million people, even with today's vastly advanced antiviral and antibacterial drugs, vaccines, and prevention knowledge (Taubenberger and Morens 2006).

Speaking at a conference on international security policy in Munich in 2017, Bill Gates ranked pandemics (including the growing potential for intentional or accidental release of a synthetic or modified agent) alongside climate change and nuclear war as the three biggest threats facing the world (Munich Security Conference 2017).

³ This is also why today's pandemic risk prediction models have begun to introduce the concept of "effective distance" rather than actual distance to understand how infections are likely to spread. See Brockmann D1, Helbing D. 2013.

Yet, pandemics have not caught the imagination of world leaders in quite the same way as climate change and nuclear wars. Pandemics attract a lot of attention when they are at their height; but once the worst is over, the sense of urgency disappears, both at the global and country level, and we start all over again.⁴ At the opening session of the Skoll World Forum in Oxford, U.K., World Bank Group President Jim Kim said that "what happens every time" in the face of pandemics is a cycle of "panic, neglect, panic, neglect" (Devex 2015).

The Challenge of Financing Preparedness

The huge social, health, and economic devastation wrought by Zika and Ebola has put the challenge of strengthening outbreak preparedness and responsiveness of countries on the agenda at the highest political level. But this is not the first time that the world's attention has been

⁴ The story of Zika carries a potentially threatening message. As the world scrambled to find ways to counter transmission and understand the virus' impact of fetal brain development, it is difficult to avoid the thought that earlier recognition of the surge in microcephaly cases and the link to Zika infection would have been immensely valuable. When countering infectious disease outbreaks, days and weeks matter, and preparation is everything.

drawn to the need to be better prepared; earlier viral outbreaks such as SARs and H1N1 had also led to similar calls. And yet, countries chronically underinvest in preparedness planning, disease and risk monitoring, and primary care. Health sector development strategies commonly lack focus, and public finance management lacks means to target resources. Complex political economies undermine strategic priority setting, and development assistance largely remains targeted to specific diseases. External assistance prompts governments to shift budgets away from health, and the financing of health often falls short of any internationally agreed target, such as the Abuja pledge of allocating at least 15 percent of annual budgets to improve the health sector (WHO 2011).

What Does It Take to Be Prepared?

Long before the recent Zika and Ebola outbreaks, global initiatives had established a comprehensive set of guidelines, tools, and technical assistance to help countries improve their preparedness and response capacity. The IHR, promulgated in 1969 under the auspices of the World Health Organization (WHO), were broadened in 2005 to guide countries in detecting, assessing, reporting, and responding to all events that could potentially constitute public health emergencies of international concern (PHEIC).

All WHO member states are required to have or to develop minimum core public health capacities to implement the IHR effectively (WHO 2016). Progress in building the needed capacities has been slow, however, and in 2014 only one-third of the countries in the world reported having the ability to assess, detect and respond to public health emergencies (CDC 2016). Countries in Africa scored the lowest across most preparedness indicators, and only about two-thirds reported developing multi-hazard national public health emergency preparedness and response plans.

WHO has also updated its global influenza preparedness plan, which outlines components that countries should include in their national preparedness plans with a focus on core public health components, including surveillance, reporting, communication, and case management. Subsequent guidance expanded preparedness to include other sectors, such as education and interior, in a “one country” approach (WHO 2007).

More recently, about 55 countries promoted GHSA. This agenda covers 11 technical targets, including activities related to the prevention of outbreaks, promotion of key practices, and actions to improve countries’ response capacity. Recent years have also seen a resurgence in the concept of health systems strengthening, with a particular emphasis on increasing systems’ “resilience” (Kruk et al 2015). The prescription for health systems resilience emphasizes the spectrum of essential inputs, including: health workers, infrastructure, supply chains, health information, surveillance, infection prevention and control, and community mobilization.

Why Is This So Hard?

With growing international attention focused on the problem, why have many countries still struggled to achieve preparedness against infectious threats? Part of the answer is obvious. The requirements for preparedness are complicated (Exhibit 2.4). At a minimum, countries need a solid legal and regulatory foundation, adequately trained and equipped public health workforce, strong surveillance and response framework, functional national public health laboratories, and robust multi-sectoral coordination. Many of these components lie in different parts of government and are often financed through a variety of different mechanisms, ranging from emergency allocations, routine sectoral provisions and ad-hoc apportionments. Faced with this complexity, it is not surprising that many countries have struggled even to draft a national

EXHIBIT 2.4 Key Challenges for Financing of Preparedness Activities at the National Level



Competing needs for resources within the health sector, which result in higher priority for curative care at the expense of investments in strengthening public health capabilities



High uncertainty of direct reward from investments in preparedness—not easy to ‘sell’ an investment which, if successful, results in something avoided



Competing investment projects in other sectors with higher/more immediate perceived return, in the context of constrained resources



Multi-sectoral, cross-department and multi-level (global, regional, national and sub-national) coordination and efforts needed for effective implementation

plan of action with specific activities, timelines, and budgets. Rational and increased financing will require establishing a common vocabulary, together with a common framework for defining priorities and core investments for preparedness. This is also important to avoid a “flavor of the month” approach whereby financing partners use the word preparedness to justify whatever investment they would like to make.

Preparedness and Systems Performance

The challenge of financing preparedness is not limited to ensuring a sufficient level of resources. In many instances, there has been insufficient consideration of the way different system sub-components need to be combined to achieve satisfactory performance in the context of uncertainty and emergencies.

To grasp this more clearly, it is helpful to recall what we mean by “preparedness.” Preparedness for pandemics refers to a range of health and non-health interventions, capabilities, and capacities at community, country, regional, and global levels. Their purpose is to prevent, detect,

and respond to the spread of disease and other hazards, mitigating social disruptions and limiting risks to international travel and trade.

Three aspects of investing in pandemic preparedness deserve special mention. First, preparedness is part of a broader approach to disaster risk management. Resources put into preparedness are investments in critical risk management for countries, regions, and the global community as a whole. Second, preparedness is a core component of health systems strengthening, both depending on and contributing to other parts of the health system. This means the costs of achieving preparedness depend on what other systems components exist and how well they work. This is also why preparedness measures cannot be undertaken for a single pathogen: “preparedness” reflects the performance of the full system. Third, pandemic preparedness is inherently multi-sectoral, requiring cooperation across different arms of government and with the private sector. While experts have acknowledged these points, the persistence of narrow and fragmented approaches to financing preparedness has constrained efforts to build more resilient health systems.⁵

Clarifying these concepts matters, because smart, timely, well-directed investments in preparedness can make a life-or-death difference for people. The ability of the health system to mount an effective response to Ebola virus outbreaks in Nigeria, Democratic Republic of Congo, and Uganda highlight the importance of critical components of preparedness and response even in the context of overall weakness. The experience of Vietnam illustrates what can be achieved when ambition goes beyond strengthening just a few components. Vietnam has implemented a comprehensive One Health program drawing together the financing of agricultural, public health, health care, and public education programs.

⁵ GHSA was largely created as a way for funders to see where the dollar was going and how it was making an impact.

Universal Health Coverage and Security

Much of modern health development policy has been marked by recurrent tensions between disease-specific programs (for example, addressing smallpox, malaria, or HIV/AIDS) and efforts to secure comprehensive improvements in health systems. Disease-specific programs can achieve remarkable gains, sometimes with dramatic speed, but may fail to build broader capacities. Systems-building efforts may initially yield scant measurable results. The tensions among different approaches, and the concern to swiftly remedy perceived inadequacies, have sometimes led to abrupt shifts in the global health vocabulary, with consequences for investment flows. Thus, in a matter of two decades, resource-constrained governments, policy experts, and political commentators alike have welcomed and adopted the refrains of health system strengthening (HSS), universal health coverage (UHC), resilient health systems, and global health security (GHS)—perhaps not always fully understanding what these terms mean or believing them to be different ways of saying the same thing. This can matter because although these agendas all point in broadly the same direction, the different nuances lead to different priorities and the sheer profusion of terms can cause confusion.

Consider, for instance, the notion of health system strengthening, which refers to the holistic approach of supply-side interventions directed at the core functions of a health system, including financing, production, delivery, governance and management. It involves “putting together the right chain of events—financing, regulatory framework for private-public collaboration, governance, insurance, logistics, provider payment and incentive mechanisms, information, well-trained personnel, basic infrastructure, and supplies—to ensure equitable access to effective health interventions and a continuum of care

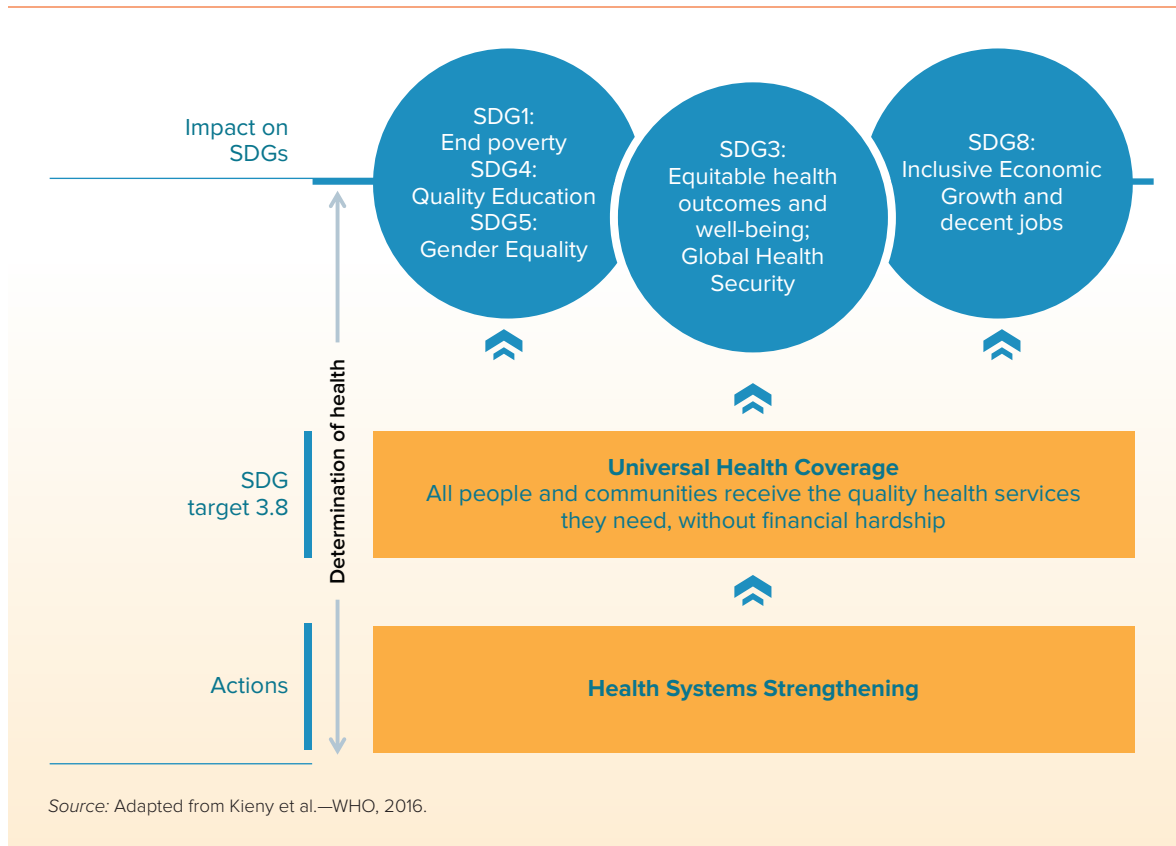
to save and improve people’s lives” (World Bank 2007). Distinct from specific disease-control technologies, this approach to developing the health sector gained popularity in the last couple of decades. It offered a constructive approach to multiple problems: the shifting burden of disease, growing duplication in disease-specific investments, and increasing system-wide bottlenecks that threatened the success and sustainability of disease-specific programs. It is important to note, however, that health system strengthening is not a *result* in itself; rather, it comprises the *instruments* by which the health sector policy *objectives* are realized (Kutzin and Sparkes 2016).

These health sector policy objectives are captured in the goals of UHC, health security, and health resilience. The quest for UHC is a demand for both better health and greater equity in health. UHC is only attained when everybody has access to affordable, quality health services, and no one is forced into poverty to pay for the health care they need (Kutzin and Sparkes 2016). Health security can be seen as a component of UHC, since protection against health risks is a key part of health coverage (Anand 2011). Health system resilience is the ability of a health system to absorb shocks, respond with the provision of needed services, and sustain gains (Kruk et al 2015).

WHO defines UHC as access to a broad range of services, which would include the services that contribute to preparedness. From this perspective, preparedness is the output indicator, and is a subset of UHC (Exhibit 2.5). The WHO framework clearly delineates that health systems (inputs) contribute to preparedness (specific output) which is a subset of UHC (broad output). UHC including preparedness then contributes to health security (impact).

Some worry that a narrow focus on UHC leads to the prioritization of investments in curative healthcare services at the expense of

EXHIBIT 2.5 Investing in Health Systems to Reach the SDGs



strengthening public health competencies. In theory, attainment of UHC requires strengthening all aspects of the health system—including those that produce, finance and deliver health promotion, disease prevention, treatment, rehabilitation, and palliation—so that all people who need health services receive them, without undue financial hardship (Boerma et al 2014). In practice, however, public health interventions can take a back seat. Schmidt et al (2015) identify several pressures that can lead to the prioritization of the curative clinical services at the expense of population-level health interventions in pursuit of UHC goals. While the concept of UHC certainly incorporates public health services there is real possibility that public health interventions are under-prioritized in resource-constrained countries pursuing the UHC goal (Kutzin and Sparkes 2016).

Universal Health Security

At its simplest, health security refers to the protection from threats to health (Heymann 2015), and entails the intrinsic value of protection against risk (Anand 2011). Ensuring health security for all by strengthening health and related systems to protect all citizens from threats to health is an objective that seems entirely consistent with UHC, although universal health security perhaps goes further than the more narrow interpretations of the UHC goal. Universal health security includes reducing the vulnerability of populations to health threats that spread within and across national borders and from inadvertent or malicious actions as well as natural causes. Moreover, universal health security both depends on and contributes to health systems strengthening and health systems resilience.

No terminology is perfect. For example, in some countries, “security” is a loaded and equivocal term. Yet even acknowledging these limitations, universal health security remains a useful framing concept, not least because it clearly connects the health agenda to both human security and economic security, enabling health security to be thought of in the same light as other major risks that governments should manage.

Similarly, the concept of health security connects health action to the broader development agenda. As Ebola demonstrated, pandemics can completely knock countries off their development trajectory, undermining hard won achievements, not just in health but across multiple dimensions of human and economic development. Seen in this light, universal health security is a way of safeguarding progress towards the Sustainable Development Goals.

Integrated Action to Reach the Goal

In the remainder of this report, we set out 12 specific recommendations to ensure adequate and sustained financing of preparedness. There is a risk that countries and development partners may only accept some of these recommendations or may implement them only partially. However, the recommendations are integrated and interdependent. Together they constitute a unified framework for sustainable financing of preparedness. To be effective in achieving universal health security, we need to pursue them all. For this reason, we call on the global community to implement the framework in its entirety. We address this call to national governments, international and regional bodies, and all development partners. In protecting humankind against infectious disease crises, global preparedness is only as strong as its weakest link.

RECOMMENDATION 1: National governments and development partners should commit to a path towards universal health security by adopting

and implementing the framework set out in this report and embodied in Recommendations 2–12.

This chapter has summarized the case for investment in pandemic preparedness. If countries and partners are convinced by the arguments, what should they do next? Chapter 3 looks at how countries can identify the gaps in their pandemic defenses, assess resource needs, and develop an action plan.

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3

IDENTIFYING GAPS AND ESTIMATING FUNDING NEEDS

International Cooperation on Infectious Threats: Historical Background

The first International Sanitary Conference took place in Paris in 1851 in response to a cholera epidemic that ravaged Europe for nearly 15 years. A hundred years later, in 1951, member states of the newly-constituted WHO adopted the International Sanitary Regulations, which were replaced by and renamed the International Health Regulations in 1969. Narrowly focused on six serious infectious diseases (cholera, plague, yellow fever, smallpox, relapsing fever, and typhus), IHR (1969) depended on official country notification of disease outbreaks and did not establish a formal internationally coordinated mechanism to contain disease spread or ensure country commitment to standards. Further, some countries were reluctant to report diseases for fear of trade and travel restrictions (WHO 2009). The resurgence of cholera, plague, and Ebola in the 1990s exposed the limitations of IHR (1969), which led to calls for their revision in 1995, and a call to WHO in 2001 to support countries in strengthening their capacity to detect and respond rapidly to communicable disease threats (WHO 2009).

All this while, the IHR remained largely unchanged. Negligence persisted among countries, and the capacities of most countries to detect and respond to disease outbreaks remained low. This inertia was shaken by SARS, which made its first appearance in November 2002 in China's Guangdong province (Huang

2004). The disease spread rapidly around the globe. Concerns raised by SARS intensified the IHR revision process, and by 2005, the scope of the regulations was broadened to cover all public health threats, including existing, new, and emerging threats and those caused by non-infectious disease agents. The revised IHR (2005) required countries to report all possible hazards with the potential to be public health emergencies of international concern, regardless of cause, and provide this information in a timely manner.

Another important change introduced in IHR (2005) required all countries to develop, strengthen, and maintain core capacities for surveillance and response (Katz and Fischer 2010). These revisions came into force in 2007 and are binding for all WHO member states. However, they did not include an enforcement mechanism for states that fail to comply. Peer pressure and fear of tarnished international image were deemed to be sufficient motivators for countries to invest in strengthening their core public health competencies.

IHR (2005) enjoyed only a couple of years of respite before the world was shaken by another public health threat. In 2009, H1N1 triggered the IHR mechanisms. While the response was largely successful, shortcomings of the IHR (2005) also became apparent (Katz and Fischer

2010). The gaps and limited capacities in their public health systems meant that countries could not keep up with the public health, trade, and travel recommendations of the IHR. This not only exposed vulnerabilities in states whose domestic capacities were limited, but increased risks for their regional and global peers. What became clear is that, even though all WHO member states had agreed to IHR (2005), only a few had developed the mechanisms needed to meet their obligations.

Strengthening IHR Implementation: Slow Going

After the entry into force of the IHR (2005) in 2007, the 61st World Health Assembly (WHA) adopted a resolution whereby countries and WHO are required to report to the WHA on IHR implementation progress. The WHO secretariat subsequently published the IHR Core Capacity Monitoring Framework in 2010, accompanied by an IHR Monitoring Tool (WHO 2011). The Monitoring Tool identifies 13 core capacities for preparedness, detection, and response. These capacities are essential national public health functions which provide health protection for domestic populations and collectively also provide the basis for global health security.

Through the IHR Monitoring Tool, WHO asked countries to conduct annual self-assessments on IHR implementation, focusing on the 13 core capacities. Countries were requested to issue formal reports in 2012 (with additional reports in 2014 and 2016 for governments that requested extensions) to declare if they had fully implemented the regulations. However, most countries have yet to fully establish these core capacities. In 2014, only 64 countries reported meeting core capacities, while 48 failed even to respond to the WHO request (Gostin and Katz 2016). Despite extensions reaching into 2016, the situation had not changed much.

Even if all countries had reported accurately and in a timely manner, national self-assessments have been shown to provide unreliable estimates of countries' true capability. In addition, governments have not used a consistent set of evidence-based metrics to measure compliance. These deficiencies undermine the integrity and utility of self-assessments.

Every WHO IHR Review Committee and all major post-Ebola commissions have demanded that States Parties build and strengthen core capacities. Despite this, governments have not properly funded and implemented the required capacities, and international assistance has been limited (WHO 2016). Achieving IHR core capacities remains an indisputable baseline for global health security; the longer it takes to detect an event, the slower the response and the more lives lost.

Beyond Self-Assessment

Due to the recognized limitations of self-assessment-based reporting, calls for external assessment of capabilities have been raised several times, both by the WHO and other actors. In 2014, the United States, in conjunction with partners from around the world, launched the GHSA, which developed eleven specific targets to accelerate IHR and PVS implementation and piloted a health security external assessment tool and process. In early 2014, just as the GHSA partnership was launched, an Ebola epidemic began to spread in West Africa, eventually triggering the declaration of a PHEIC by the WHO and the rapid rallying of international response measures. The explosive proliferation of Ebola made very clear how insufficiently many countries were prepared for such events; none of the West African nations were in compliance with IHR.

After recommendations and approval from the Executive Board at its 136th session and the 68th World Health Assembly, the

TABLE 3.1 JEE and PVS Status

	Both PVS and JEE	Only JEE (no PVS)	Only PVS (no JEE)	Neither PVS nor JEE
Low-income countries (IDA), excluding fragile and conflict affected states	14	0	25	8
Fragile and conflict affected states	7	1	18	8
Middle and high income countries	12	3	55	48
TOTAL	33	4	98	64

WHO Secretariat proceeded to develop a blended evaluation approach that combined self-evaluation, peer review, and voluntary external evaluations, involving a mix of domestic and independent experts (WHO 2015). A task force was also established to ensure that this tool was harmonized with existing assessment tools for IHR implementation.

This process resulted in the Joint External Evaluation, which built on and included the original GHSA targets. In naming the process, “Joint” was intended to refer to an assessment combining self-assessment by a multi-sectoral team of national experts, followed by an in-country review by a second team of similarly multi-sectoral international peer experts, i.e., the “External Evaluation” (WHO 2016). The WHO Global Policy Group subsequently endorsed the JEE tool as the single standard WHO instrument to be used for externally assessing member states’ IHR capacities. Countries are expected to go through a JEE once every 5 years.

National animal health sectors also undergo internal and external assessments, facilitated by the World Organization for Animal Health (OIE). OIE has developed a well-established external standard evaluation called the OIE PVS Pathway, which assesses the quality of national veterinary services and animal health systems by identifying gaps and weaknesses in compliance with OIE international standards (OIE 2017). The PVS tool then supports and promotes the establishment of priorities and strategies to help

countries meet performance and compliance standards in a timely manner. Countries have a strong economic incentive to participate in the PVS process, since it expands their opportunities to engage in international trade in agricultural products.

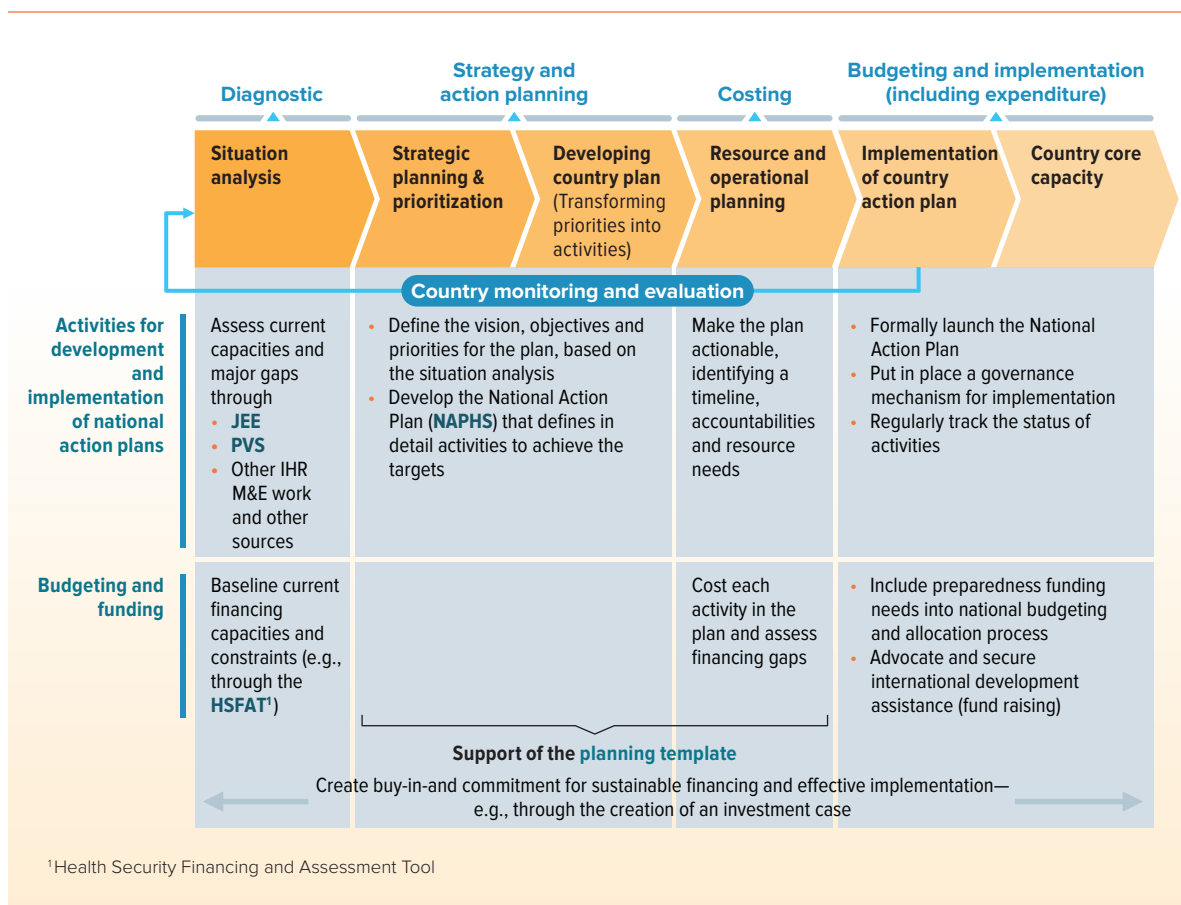
Using JEE and PVS to Map Preparedness Gaps

JEE and PVS tools thus comprise the starting points for identifying gaps in preparedness and estimating funding needs. As of April 21, 2017, 37 and 131 countries have completed JEE and PVS assessments, respectively (Table 3.1). Fourteen low-income countries have completed both JEE and PVS, while 25 have undergone a PVS assessment only. Among Fragile and Conflict-Affected States (World Bank 2017), 7 have completed both JEE and PVS, 18 have completed only PVS and 1 country has completed only JEE.⁶ A further 32 countries have scheduled JEE missions in the next eighteen months, and an additional 28 countries have expressed interest but not yet scheduled a mission. Out of 199 countries, 64 countries currently remain with neither a completed JEE nor a completed PVS (IHR-MEF 2017).⁷ Tables A3.1–3.3 (placed in the annex to this chapter) list all the countries.

⁶ The PVS assessment is more than 5 years old in 78 (out of 131) countries, which would need to refresh the assessments soon.

⁷ In addition, 6 countries (Georgia, Peru, Portugal, Uganda, Ukraine, United Kingdom) were assessed through the GHSA external evaluation during the pilot phase. This tool was later revised and replaced by the JEE.

EXHIBIT 3.1 Process for Development and Implementation of the NAPHS



RECOMMENDATION 2: (i) By the end of 2017, all national governments should commit to participate in, and by the end of 2019, conduct a Joint External Evaluation (JEE) to assess their capacity to comply with the requirements of the International Health Regulations 2005 (IHR) to prevent, detect, and rapidly respond to public health threats; (ii) By the end of 2017, all national governments should commit to participate in, and by the end of 2019, conduct an evaluation of Performance of Veterinary Services (PVS) to assess their capacity to comply with the World Organisation for Animal Health (OIE) standards.

Designing a National Action Plan

Following the identification of a baseline and gaps through JEE/PVS and other relevant

assessments, the next step is for countries to develop a plan prioritizing implementation activities. To support countries in this endeavor, the Guidelines for Development of a National Action Plan for Health Security (NAPHS, WHO 2017) explain the principles of planning, costing, financing, and implementing preparedness plans, as well as key considerations to maintain throughout the process.

Each national action plan will be specific to the country; however, a few guiding principles for effective planning can be provided (see Appendix A).

The NAPHS process includes several dimensions, beginning with situation analysis and strategic planning and prioritization exercises that establish short-, medium-, and long-term goals

BOX 3.1 The Post-JEE Planning Process in Tanzania

“This year, Tanzania made history by being the first country in the WHO African region and globally to develop a costed National Action Plan for Health Security (NAPHS). The journey has not been easy, because it has taken over a year after the country completed the JEE in February 2016. The processes of developing the NAPHS began in June 2016, three months after the JEE was completed. The NAPHS development process was started by the country’s IHR technical working group. While the focus was mainly on the JEE key findings and priority actions, other previous assessments included the World Organization for Animal Health (OIE) Performance of Veterinary Services (PVS) assessment, the Integrated Risk Profiling Assessment, the Antimicrobial Resistance (AMR) situation analysis, the integrated disease surveillance and response (IDSR) review, and the vulnerability, risk assessment and mapping (VRAM) to mention a few.

“During the costing workshop, there was an important discussion about the need for a coordination platform, preferably at the Prime Minister’s Office and the creation of an inter-ministerial committee was proposed to ensure a seamless interplay between multiple sectors and other existing plans at all administrative levels of the country.

“The Tanzania JEE has really galvanized multiple stakeholders to work together on health security in the country. Importantly, even at the regional and global level, the JEE and subsequently the planning and costing workshops brought together several agencies including: WHO (all three levels), the US CDC, Finland, the US Department of Defense, FAO, OIE, JICA, GIZ, PHE, the US Department of Agriculture, the World Bank, National Governments for cross fertilization. In terms of forging partnerships, it is not an overstatement to say that the Tanzania JEE and NAPHS development process have created and continue to create partnerships in ways not seen before. Now that the plan is costed, the focus turns to its implementation. Prior to implementation, the country is planning a high-level launch of the plan at the Parliamentary session in June 2017. The aim is to create public awareness including ensuring that Parliamentarians are aware and will lobby for sustained and adequate domestic funding.”

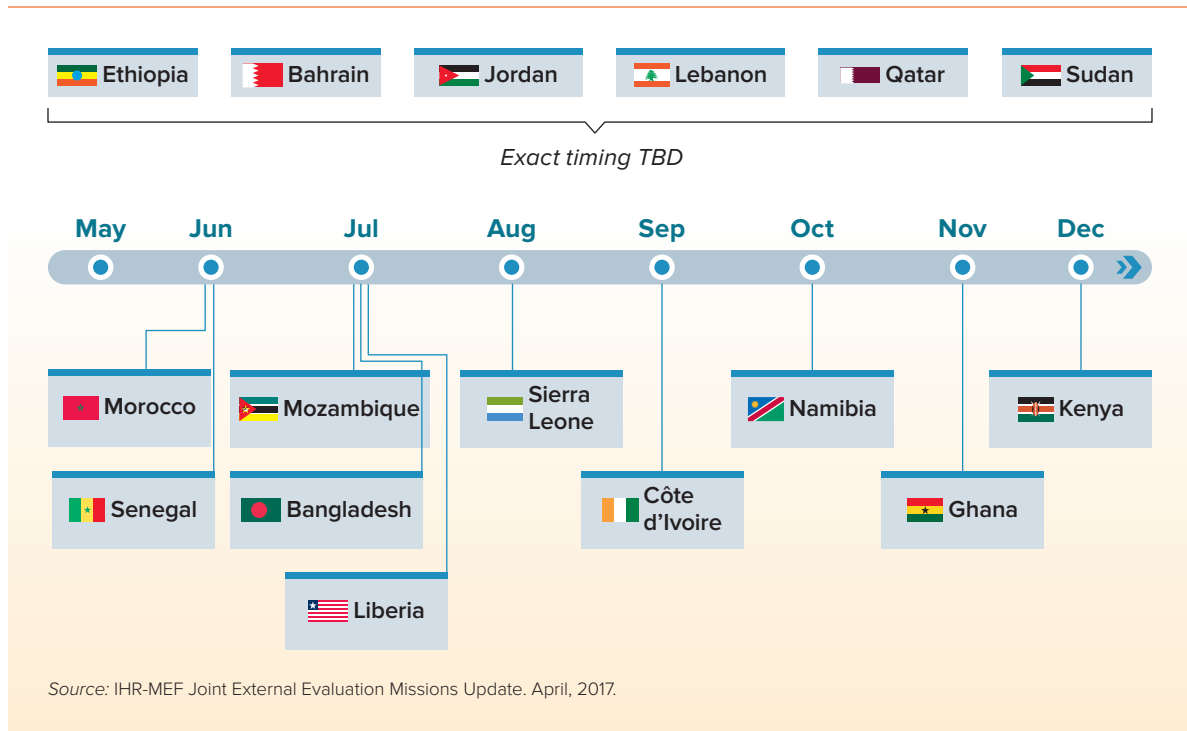
Source: <http://www.afro.who.int/en/tanzania/press-materials/item/9504-who-and-partners-develop-a-costed-national-action-plan-for-health-security.html> Accessed on June 3rd, 2017 at 16:00 hrs.

based on the gap analysis (Exhibit 3.1). Strategic planning follows the structure of the main gaps identified through the JEE assessment, and a template for planning is provided to countries and partners supporting the planning process to help them identify and prioritize actions to fill major capacity gaps. The guidelines promote the development of a monitoring and evaluation framework, which reinforces accountability and multi-sectoral engagement, and resource planning. Resource planning aims not just to

determine how much activities cost, but also to identify domestic and international financing opportunities.

Costing, referring specifically to the process of identifying resources required to undertake preparedness activities and assigning them a monetary value, provides insights on where a country has insufficient funds or a duplication of funds for activities that strengthen health security. Since the action plan is multi-year, the costing

EXHIBIT 3.2 Country Planning in Pipeline: 16 More Countries in 2017



exercise reflects the same thinking, projecting costs across the following five years of expected implementation. The exercise attempts to distinguish between capital and recurrent costs, and assists stakeholders in deciding what types of funding vehicles are relevant, depending on the task at hand.

As of April 21, 2017, three countries—Tanzania, Pakistan and Eritrea—have completed the costing exercise as part of the post-JEE preparedness planning. An example of the costing exercise for the four core capacities of health security in Tanzania is provided in Table A3.4 (placed in the annex to this chapter). Sixteen other countries have scheduled the post-JEE planning exercise in the last eight months of 2017 (Exhibit 3.2).

A further 31 countries—Bangladesh, Burkina Faso, Cambodia, Cameroon, Cote d'Ivoire, Democratic Republic of Congo, Ethiopia, Georgia, Ghana, Guinea, Haiti, India, Indonesia, Jordan, Kazakhstan, Kenya, Laos, Liberia,

Malaysia, Mali, Mozambique, Pakistan, Peru, Rwanda, Senegal, Sierra Leone, Tanzania, Thailand, Uganda, Ukraine, Vietnam, and CARICOM⁸—have also developed national plans, but they are not costed.⁹ Originally drafted with GHSA targets before the JEE was completed, these plans are currently being converted to be in line with the JEE framework.

This will still leave many countries with a completed evaluation but no announced effort to go through the critical next steps of planning, prioritization, costing, and implementation. Several elements contribute to the current limited prioritization of preparedness in many countries. The process outlined above should ideally apply to all countries. However, fragile states (e.g., those

⁸ CARICOM—or the Caribbean Community—is an organization of 15 Caribbean nations and dependencies whose main objective is to promote economic integration and cooperation among its members, to ensure that the benefits of integration are equitably shared, and to coordinate foreign policy.

⁹ Seventeen of these countries were assisted by the United States Government, which provided \$1 billion in support for the design and implementation of these plans.

experiencing conflict) need a tailored approach, since they are likely to be at high risk of infectious disease outbreaks. However, primary and secondary health care services in these countries are generally disrupted, and building long-term national preparedness capacity is not a realistic aim. The focus must be on urgent needs. These include basic preparedness functions for prevention, detection, and response, such as ad hoc immunization campaigns, surveillance, and the creation of emergency operations centers. These resources may be supplied by health partners within the scope of their humanitarian support.

The JEE framework includes Anti-Microbial Resistance (AMR) as one of the 19 dimensions for evaluation of a country's core capacities. For AMR, the JEE assessment includes all activities that present integration opportunities with infectious disease preparedness and most of the specific aspects that are particularly relevant for the countries (health acquired infections, stewardship activities, etc.). However, the creation of national action plans for health security and for AMR is currently happening in most cases through different processes. Given the substantial overlap of activities across infectious disease outbreaks and AMR (see Appendix B), and with the aim to simplify processes and have an integrated approach to country resilience, countries could benefit from a more integrated approach to preparedness and AMR at the national level. While the two topics are already mostly integrated in one of the diagnostic tools—the JEE framework—this would mean having also a joint costing, budgeting and funding process.

RECOMMENDATION 3: Within nine months of completion of JEE and PVS, national governments should develop and publish a prioritized and costed plan to implement recommendations emerging from the JEE and PVS assessments, including regional elements where relevant.

The JEE and NAPHS offer robust frameworks for country diagnostic and planning processes.

However, to ensure that countries will be able to successfully implement their planned actions and fill existing gaps in their capacities for preparedness, two additional catalytic elements need to be in place:

- A financing proposal, needed to mobilize sustainable funding over time
- A high level of buy-in and commitment—driven by the formulation of a compelling political-economic case for preparedness

These additional ingredients clearly sound desirable in theory. But how can countries secure them in practice? This is the topic of our next chapter.

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Annex to Chapter 3

TABLE A3.1 JEE/PVS Completion Status (low-income countries, excluding fragile states)

Both PVS and JEE	Only JEE (no PVS)	Only PVS (no JEE)	Neither PVS nor JEE
Bangladesh		Benin	Congo, Republic of
Cambodia		Bhutan	Dominica
Ethiopia		Bolivia	Grenada
Ghana		Burkina Faso	Moldova
Kenya		Cameroon	Saint Lucia
Kyrgyz Republic		Cape Verde	Saint Vincent and the Grenadines
Maldives		Guinea	Samoa
Mauritania		Guyana	Tonga
Mozambique		Honduras	
Pakistan		Lesotho	
Laos		Malawi	
Senegal		Mongolia	
Tanzania		Nepal	
Vietnam		Nicaragua	
		Niger	
		Nigeria	
		Rwanda	
		Sao Tome and Principe	
		Sri Lanka	
		Tajikistan	
		Timor Leste	
		Uganda*	
		Uzbekistan	
		Vanuatu	
		Zambia	

*Countries that did GHSAs assessments during the pilot phase

TABLE A3.2 JEE/PVS Completion Status (fragile states)

Both PVS and JEE	Only JEE (no PVS)	Only PVS (no JEE)	Neither PVS nor JEE
Afghanistan	Somalia	Burundi	Iraq
Cote d'Ivoire		Central African Republic	Kiribati
Eritrea		Chad	Kosovo
Lebanon		Comoros	Marshall Islands
Liberia		Congo, Democratic Republic of	Micronesia, Federated States of
Sierra Leone		Djibouti	Solomon Islands
Sudan		Gambia	South Sudan
		Guinea Bissau	Tuvalu
		Haiti	
		Libya	
		Madagascar	
		Mali	
		Myanmar	
		Papua New Guinea	
		Syrian Arab Republic	
		Togo	
		Yemen	
		Zimbabwe	

TABLE A3.3 JEE/PVS Completion Status (middle and high income countries)

Both PVS and JEE	Only JEE (no PVS)	Only PVS (no JEE)	Neither PVS nor JEE
Albania	Finland	Algeria	Israel
Armenia	Saudi Arabia	Angola	Jamaica
Bahrain	United States of America	Argentina	Japan
Belize		Australia	Kazakhstan
Jordan		Azerbaijan	Korea, DPR
Morocco		Barbados	Kuwait
Namibia		Belarus	Macedonia FYR
Oman		Bosnia	Malaysia
Qatar		Herzegovina	Mauritius
Tunisia		Botswana	Mexico
Turkmenistan		Brazil	Palestine
United Arab Emirates		Brunei Darussalam	Panama
		Bulgaria	Paraguay
		Canada	Peru*
		Chile	Philippines
		Colombia	Romania
		Costa Rica	Serbia
		Dominican Republic	Seychelles
		Ecuador	South Africa
		Egypt	Suriname
		El Salvador	Swaziland
		Equatorial Guinea	Thailand
		Fiji	Trinidad and Tobago
		France	Turkey
		Gabon	Ukraine*
		Georgia*	Uruguay
		Iceland	Venezuela
		Indonesia	
		Iran, Islamic Republic	
			Andorra
			Antigua and Barbuda
			Austria
			Bahamas
			Belgium
			China
			Cook Islands
			Croatia
			Cuba
			Cyprus
			Czech Republic
			Denmark
			Estonia
			France
			Germany
			Greece
			Guatemala
			Hungary
			India
			Ireland
			Italy
			Korea, Republic
			Latvia
			Liechtenstein
			Lithuania
			Luxembourg
			Malta
			Monaco
			Montenegro
			Nauru
			Netherlands
			New Zealand
			Niue
			Norway
			Palau
			Poland
			Portugal*
			Russian Federation
			Saint Kitts and Nevis
			San Marino
			Singapore
			Slovakia
			Slovenia
			Spain
			Sweden
			Switzerland
			Tanzania (Zanzibar)
			United Kingdom*

*Countries that did GHSAs assessments during the pilot phase

TABLE A3.4 Preparedness Costing Exercise, Tanzania, FY 2017 (US\$ '000)

	2017	2018	2019	2020	2021	TOTAL
Prevent	5,834	11,946	12,335	9,338	8,901	48,355
Detect	8,628	13,134	15,481	12,870	8,162	58,274
Preparedness	1,467	2,970	606	735	788	6,566
Other IHR-Related Hazards, Points of Entry	2,454	5,556	5,752	3,378	3,278	20,419
Cross-Cutting		154	154			308
GRAND TOTAL	18,383	33,760	34,329	26,321	21,129	133,922

4

PREPARING A FINANCING PROPOSAL, A COMPELLING INVESTMENT CASE AND A CHANGE MANAGEMENT STRATEGY

Once a country has developed a costed and prioritized plan, the next steps are to work out how to finance this plan and then how to implement it effectively. This requires three key components: first, a realistic financing proposal to ensure inclusion in domestic budgets and, where relevant, win the support of development partners; second, a compelling investment case that ensures sustained economic and political support for improving preparedness; and finally, a change management strategy that facilitates the committed engagement of relevant stakeholders.

All three components are essential. A financing proposal without an investment case will get no traction. Even a well-financed plan without a change management strategy will likely fail to deliver. Reinforcing preparedness is not a quick fix: it is a complex, multi-stakeholder process that needs to stretch well beyond health ministries and can often entail far reaching changes in established attitudes, practices and institutions.

Public health priorities typically receive limited support in resource-constrained low-income countries, where health budgets are driven primarily by immediate health needs and vertical programs, and where finance ministries are often less inclined to support resource commitments for longer-term payoffs. Despite evidence of high economic rate of return on investments in preparedness, the health and related

ministries are usually not very successful in securing the funding needed. When the competition for domestic and donor resources is fierce, advocates of preparedness must excel in making their case. In a keynote address delivered at the first Annual Universal Health Coverage Financing Forum in Washington, DC, April 14–15, 2016, Ngozi Okonjo-Iweala, former Minister of Finance, Government of Nigeria and presently the Chair of the Board of *Gavi, the Vaccine Alliance*, noted that “Ministers of Health and the health community in general really need to learn to speak the language of Finance Ministers.”¹⁰

Preparing a Financing Proposal

A robust and realistic financing proposal provides the essential bridge between having a costed and prioritized plan for reinforcing preparedness, and having an adequately-funded plan fully reflected in line items in the national budget. Developing a detailed financing proposal for preparedness is often a complex exercise because it cuts across so many different types of activity and different parts of government.

First, spending on the capabilities and infrastructure required for preparedness typically

¹⁰ Accessed on June 3rd, 2017 at 16:00 hrs. URL: <http://blogs.worldbank.org/health/mobilizing-domestic-resources-universal-health-coverage>

cuts across multiple departments and budget priorities within the health ministry. For example, some aspects of preparedness, such as front line disease surveillance, diagnostics and curative care, are intrinsically embedded within the primary care delivery and hospital systems. Other aspects, such as the most sophisticated biosafety and biosecurity procedures appropriate for the most lethal agents, national emergency plans and vaccine stockpiles, are typically established via specialist entities at a national level. Furthermore, other priority health initiatives, such as combatting anti-microbial resistance or tackling endemic infections like malaria or tuberculosis, may overlap with or inadvertently compete with the preparedness agenda. It is important that preparedness does not become yet another vertical silo, but complements and contributes to these other objectives, forming part of the broader agenda of health system strengthening.

Second, significant components of the preparedness agenda involve other government ministries, such as the ministries of agriculture, interior and trade. This inevitably triggers debates about which part of government should pay for which elements of the preparedness agenda. Coordination between the ministries of health and agriculture is particularly important given that so many infectious disease threats are zoonotic in origin. Reinforcing veterinary systems of surveillance and control of animal health can be an important part of strengthening preparedness.

Third, in many countries there is a division of responsibilities for different elements of preparedness between the national government and entities at a state, provincial or community level. This can create considerable scope for arguments about budget responsibilities.

Fourth, the “preparing to respond” component of the preparedness agenda must be aligned with each government’s overall emergency response strategy, encompassing pandemic

response alongside other risks including earthquakes and hurricanes. This inevitably involves multiple entities. According to the Sendai Framework for Disaster Risk Reduction,¹¹ the international accord on disaster risk reduction, “effective disaster risk reduction and management depends on coordination mechanisms within and across sectors and with relevant stakeholders at all levels, and it requires the full engagement of all state institutions of an executive and legislative nature at national and local levels and a clear articulation of responsibilities across public and private stakeholders, including business and academia, to ensure mutual outreach, partnership, complementarity in roles and accountability and follow-up” (UNISDR 2015).

Fifth, where development assistance is involved, issues often arise around the trade-offs between domestic resourcing and development assistance, plus challenges in measuring and coordinating donor flows given different development partners’ distinct priorities and reporting requirements. Finance ministries may hold back committing domestic resources if they believe development assistance can be obtained for this purpose. Unless there is flexibility and coordination, development partner priorities can be difficult to reconcile with the country’s own plan.

Sixth, where private sector health providers or non-governmental organizations play a critical role, decisions need to be made around the resourcing of these activities and their integration within the overall plan. Where private for-profit providers play a critical role in a country’s health care delivery, the answer may be to impose regulations requiring such providers deliver the relevant elements of the

¹¹ The Sendai Framework, adopted by UN Member States on 18 March 2015 at the Third UN World Conference on Disaster Risk Reduction in Sendai City, Miyagi Prefecture, Japan, is a 15-year, voluntary, non-binding agreement which recognizes that the State has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders. It aims for the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.

pandemic plan (such as disease surveillance for the patients they cover) at their own cost. Where non-governmental agencies play a critical role, consideration must be given that these are funded sustainably.

Finally, where regional networks and partnerships play an important role in strengthening preparedness, these often require distinct financing arrangements. Examples of regional initiatives for preparedness include the Mekong Basin Disease Surveillance, Southern Africa Center for Infectious Disease Surveillance, and the Middle East Consortium on Infectious Disease Surveillance.

Given these dimensions of complexity, it should not surprise that many countries have struggled, or at least, taken considerable time, to translate the plans resulting from their JEE and PVS assessments into robust financing proposals. On top of costing the required improvements, it is necessary to allocate these costs across the different entities in a manner that fits with a country's established budgeting principles and processes. Doing this rigorously involves mapping both the proposed additional investment and ideally, existing spend across multiple entities and at least 6 dimensions:

1. Administrative, legal, and regulatory measures at a national level that relate pandemic preparedness and response-readiness to all hazards, such as emergency operations center and communication systems.
2. Capacities integrated within the established preventive and curative health services that play a critical role in protection against infectious disease outbreaks, such as the overall system for capturing disease incidence and standard diagnostic services.
3. Stand-alone or specialized public health capabilities and infrastructure specifically dedicated to the identification, prevention, containment and response to infectious

disease outbreaks, including biosafety/ biosecurity arrangements, sophisticated laboratory services, and mechanisms for stockpiling vaccines, therapeutics and emergency equipment, plus relevant research and development capacities.

4. Capacities being introduced or developed as part of other health initiatives, such as those directed against anti-microbial resistance, endemic diseases, or those designed to reinforce key delivery systems, such as for maternal care.
5. Capacities within the veterinary health services relating to the identification and control of potentially zoonotic infections.
6. Capabilities and infrastructure in sectors other than health and veterinary, such as agriculture, food, chemical, transport, etc., that relate to pandemic preparedness.

There is no single, universally applicable approach to surmounting these challenges, since every country's budgeting system and administrative arrangements are different. Yet, various tools are available. For example, the World Bank, with financial support from an Australia-led multi-donor trust fund, is developing a tool called the Health Security Financing Assessment Tool (HSFAT), which defines health security as the protection of human and animal health from infectious diseases and other public health risks and emergencies, and addresses health risks at the human-animal interface as it considers the prevent, detect, respond, and other IHR-related hazards. Structured in line with the JEE protocol, HSFAT examines important elements of the post-emergency or recovery phase of the response, and reviews coordination and implementation arrangements at national and subnational levels for pandemic preparedness and response efforts. HSFAT is currently being piloted in Vietnam with the intent to roll it out more broadly in the second half of 2017.

Since it is important that investments in preparedness are integrated with a country's overall

BOX 4.1 The Health Security Financing Assessment Tool

The HSFAT is organized into seven sections:

1. *Health Security Organization* gathers essential information about current health security efforts, for example as identified by the JEE, to define the scope of necessary financing arrangements
2. *Stakeholder Mapping* identifies the key players in health security in the country
3. *Institutional Assessment* examines the functionality and appropriateness of coordinating mechanisms and implementation arrangements
4. *Macro-fiscal Context* provides information on the country's overall fiscal space to address health security financing
5. *Financing for Health Security Budgeting and Resource Allocation* reviews the budgeting, resource allocation and resource mobilization for health security
6. *Financing for Health Security Components* assesses the funding for specific health security action packages as defined in the JEE
7. *Efficiency and Sustainability* of health security financing examines issues related to allocative, technical and economic efficiency and sustainability

healthcare expenditure planning, there would be merit in the World Bank and WHO working together to support countries, linking the HSFAT with the broader medium term expenditure framework, in the context of the National Health Accounts and preparedness sub-accounts being developed for 2018.

RECOMMENDATION 4: Depending on the national budget cycle, but ideally within three months of developing a prioritized and costed plan following JEE and PVS assessments, national governments should prepare a detailed financing proposal to support implementation of the plan to improve preparedness.

Developing a compelling investment case and change management strategy

While a costed, prioritized plan and robust financing proposal are essential prerequisites for

securing sustainable funding for preparedness, experience suggests that they are not sufficient to obtain the money and deliver the plan. What is also required is a compelling investment case and a comprehensive change management strategy.

The optimal mix of arguments to be used to make the investment case will vary from country to country, depending on the scale of additional investment required and the broader political and economic context. However, as shown in Exhibit 4.1 the arguments are likely to be based on four motivations: (i) ensuring economic stability and growth; (ii) contributing to universal health coverage; (iii) improving security and protecting social stability; and (iv) managing externalities to the regional and global community. Some stakeholders, such as the finance ministry, may worry most about the risks to economic stability and growth of the country, given the severe disruption infectious disease outbreaks can cause to everyday economic life, trade and investment. Others

EXHIBIT 4.1 Potential Argument Library Based on the 4 Key Motivations of Stakeholders

Ensuring economic stability and growth of the country	Contributing to universal health coverage	Improving security and protecting social stability	Managing externalities to regional and global community
<ul style="list-style-type: none"> Preparedness activities require a relatively small annual spending to prevent or limit extremely high future losses, resulting from: <ul style="list-style-type: none"> Reduced productivity from infected groups and slow-down of economic activity Direct costs of response activities The economic cost of outbreaks can be disproportionate to the number of people infected (if the threat triggers panic reactions, e.g., limits the circulation of goods and people, absenteeism) In addition, even in “non-crises times”, foreign direct investments in certain sectors (e.g., tourism) may be discouraged by a perceived higher risk of epidemic 	<ul style="list-style-type: none"> Strengthening preparedness against disease outbreaks protects the population and contributes to universal health coverage Pandemic preparedness enables improved prevention, detection and response to regularly occurring epidemics, specifically in certain geographical areas (e.g. meningitis, yellow fever, cholera...) Preparedness activities enable earlier detection and faster response to outbreaks: this has proven to be effective in reducing the spread of infectious diseases (changing the “shape of the curve” of infected people) 	<ul style="list-style-type: none"> Bioterrorism threat: the same activities that improve pandemic preparedness can protect against the risk of bio-security Preparedness activities can reduce the potential loss of key security personnel and/or disruption of capacity to perform security activities Preparedness activities can reduce social disruption that results from infectious disease outbreaks, thereby protecting social stability 	<ul style="list-style-type: none"> After the Ebola crisis in 2014–15, the world has realized that preparedness is key to global health security International funders are willing to support investments in public health and may give preferential lending terms and increased funding to countries that prioritize preparedness

may be motivated more by the potential to save lives and contribute to the strength of the health system. Some constituencies may be concerned about the potential impact of pandemics, whether natural or as a result of bioterrorism, on a nation’s security, and more broadly on the need to protect governance and social stability. And finally, others, including neighboring countries and development partners, may be motivated by the positive effect investing in preparedness can have on reducing externalities for the regional and global community.

In making the economic arguments, it will be much more powerful if economic estimates of the potential losses from pandemics at a global level can be translated into more regional or national estimates. While many countries will have their own approaches for doing this, Appendix C could provide a helpful starting point.

Given the cross-cutting, multi-stakeholder nature of preparedness, an effective change management strategy is also required to ensure successful delivery of even a well-funded plan. Multiple parts of government, the private sector and civil society must be engaged and coordinated to achieve the desired objectives. Formal mechanisms—clear processes, tools and systems, including financial incentives—are key to supporting implementation. At the same time, other important elements need to be in place, such as:

- Buy-in and engagement of country leadership and other key influencers from the beginning of the diagnostic phase for sponsorship; normally, this starts with one sponsor in the country (e.g., the Prime Minister, Minister of Health, or other key actor); the country-level investment case mentioned above is key to support buy-in and understanding of the risks

- Mobilization of the right capabilities and expertise; this includes the creation of an attractive career path and learning opportunities for experts working on preparedness-related topics
- Inclusion of preparedness in the leadership's agenda for communication with their citizens and with partners and stakeholders (including the private sector and civil society) within the country and in international forum

There is no single, universally applicable approach to devising the investment case and change management strategy for a particular country. One practical approach is placed in Appendix D, which provides a framework and suggestions for development of the investment case.

RECOMMENDATION 5: Each national government should develop an investment case, articulating the political and economic arguments for integrating the costed plan into national budget cycles and committing resources to reinforce and sustain preparedness, plus a change management strategy to engage and coordinate relevant stakeholders.

Notwithstanding that countries move forward with recommendation 2–5, its implementation may well take us to end of 2018. The current Ebola outbreak in DR Congo and the weekly reports of public health events in Africa (WHO 2017) suggest the urgency for countries to

allocate some funds to preparedness already in the 2018 annual budget even before the IWG report is accepted and implemented and steps are put in place to generate incremental resources for preparedness.

Identifying new sources of financing, both domestically and through external assistance, is a big challenge for resource-constrained economies. This is the focus of the next chapter, which examines how countries can mobilize and allocate resources to strengthen pandemic preparedness.

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5

IDENTIFYING SOURCES OF FINANCE AND MEANS OF MOBILIZING/ALLOCATING FUNDS TO PREPAREDNESS

Government Spending on Health: Variations Across Countries

There are vast differences across countries in how much of their public resources they spend on health, a metric that is a good proxy for the extent to which health is prioritized by governments.¹² World Bank data suggests that in 2014 the share of health in aggregate government expenditure in 190 countries ranged from 2.4 percent in Timor-Leste to 27.9 percent in Andorra, with a mean of 11.8 percent. Unsurprisingly, higher income countries devote a larger share of government expenditure to health (17.8 percent in the high-income OECD countries) than do lower-income countries (9.8 percent in the low-income IDA countries).

However, significant variations exist in the share of health in total government spending even after controlling for national income. Among countries under \$5,000 per capita income, health's share of aggregate government spending ranges from a low of 2.4 percent in Timor-Leste to a high of 23.9 percent in Nicaragua. Low-income countries that allocate more to health from public resources than the IDA average of 9.8 percent include Rwanda, Madagascar, Uzbekistan, Sierra Leone, Uganda, DRC, Burkina Faso, Sri Lanka, Nepal, Zambia, Sudan, Liberia,

Afghanistan, Tanzania, Kenya, Lesotho, Burundi, Vietnam, Gambia, Malawi and Nicaragua. Likewise, there are many high-income countries (>\$10,000 per capita) that allocate less than the IDA average of 9.8 percent of aggregate government expenditure to health. These include Kuwait, Qatar, Malaysia, Oman, Brazil, Argentina, Gabon, Saudi Arabia, Russia, Seychelles and Latvia.¹³

Empirical analyses do not provide good explanations for the observed variations in government prioritization of health. In a review of the sparse literature on cross-country comparisons, Tandon et al (2014) find that factors such as democratization, lower levels of corruption, ethnolinguistic homogeneity, and more women in public office appear to be correlated with higher shares of government spending on health. However, the authors note that these findings are sensitive to model specification. The study reports that countries that explicitly focus on expanding the breadth and depth of health coverage, as opposed to those that focus on budgetary

¹² Government spending on health is probably a good proxy for spending on preparedness, on which good data is not available.

¹³ The shares of government expenditure throw light only on the issue of prioritization, not on government health expenditure across countries, which depends not only on health's share in the budget but also on the budget amount. Other factors that are important in any consideration of government spending on health are efficiency of allocations within the overall envelope and the extent to which public financing for health is pro-poor in its outlays.

targets only, are more likely to be able to prioritize and sustain allocations to health.

Against this background of wide variations in national government health spending, this chapter focuses on mobilizing and allocating resources for preparedness. It explores options related to domestic resource mobilization, external development assistance, and the private sector, and it looks at innovative financing models countries may want to consider.

Scale of Financing Required for Preparedness

Estimates of financing required for preparedness vary dramatically, depending on whether underlying health system capacities need to be strengthened first or whether only a limited set of specific preparedness capacities must be created. The post-JEE costing exercises in Tanzania and Pakistan suggest that just \$0.5 to \$1 per capita per year may suffice. An analysis of self-assessed requirements under IHR in several other countries, such as Bangladesh, Nepal and Indonesia, also result in similar modest estimates.

Yet the investments required will be much higher if underlying clinical capacities must be built first, especially where it is necessary to: build and equip new facilities or reconstruct damaged or destroyed facilities; provide training and hire health workers; secure commodities and supplies required to deliver a basic package of services; create a logistics system including emergency relief for protracted emergencies; strengthen local governance structures; introduce financial management systems and health information systems. In a detailed analysis of a sample of 43 lower and middle income countries without the foundations for emergency preparedness capacity, Soucat et al (2017) calculate resource needs in the range of \$15–\$30 per capita per year for low-income and fragile states.

In general, the investments required for preparedness will vary significantly across countries depending on whether: (1) they already have reasonably well-functioning health systems, that just need a stronger overlay of specific preparedness capacities; (2) they need to fix underlying deficiencies in the health systems and then integrate preparedness capacities; and (3) they are fragile or failed states, and lack even the very basic systems components, which must be created before preparedness can be meaningfully addressed. For these reasons, and because it is difficult to get a precise assessment of the amounts already being spent, it is difficult to come up with a single figure for the additional investments required. However, the range of \$1.9–\$3.4 billion per year suggested by the NAM Commission is probably not far off the mark. Incremental investments of this scale would certainly enable significant improvements in universal health security.

Domestic vs. International Funding: Basic Principles

As a fundamental principle, countries should aim to increase their domestic spend on development and specifically health, including preparedness, to maximize country ownership and self-reliance over time. This idea has been articulated in many settings: for example, the commitment of African Union countries to allocate 15 percent of their national budgets to improve the health sector (Abuja declaration 2001), and the partnership for improved domestic research mobilization (Addis Tax Initiative 2015).

Whenever international development assistance is deployed, it should focus on “catalytic” activities or activities that have high global externalities and low domestic demand. Catalytic activities allow a step change in a country’s level of preparedness. These are expected to be mostly one-off costs—but can also be recurring

costs, if these are critical to establish capacities in the countries, or if executing certain functions at a centralized level enables scale efficiencies. Activities with high global externalities and low domestic return are those that promise high impacts for global risk mitigation but may be deprioritized in countries without international support.

Regional entities and neighboring countries can play an important role in providing technical and financial support for preparedness activities in cases where they can add value through: coordination (e.g., the establishment of the Mekong Basin Disease Surveillance network and Africa CDC); economies of scale (e.g., joint drug procurement in Central America by SICA); or sharing expertise.

The private sector should also be included across the entire preparedness planning process, and its expertise should be leveraged in carrying out planning activities.

Domestic Resource Mobilization for Preparedness

Governments that want to invest in preparedness need to generate additional fiscal space for health in ways that increase public spending in the desired areas of attention without jeopardizing the government's long-term financial sustainability. The simplest way of generating additional financing for preparedness is by increasing its allocation at the expense of spending on other activities. But this is not always practical, both because of the difficulties associated with agreeing which activities to stop financing and because of the high unmet demand for increased investments in other public-good interventions.

Improved Tax Collection

The search for additional resources therefore requires an assessment of other sources of fiscal space, such as a conducive macro-fiscal environment following high rates of economic growth, higher tax collections, increased borrowing, higher levels of development assistance, and savings generated by increased efficiency in current areas of public spending. All these potential sources of fiscal space are equally applicable to health and other sectors, and it is therefore important that countries express their specific commitment to preparedness through the portion of new public finance they are willing to allocate to it.

We believe that domestic resource mobilization (DRM) is the key to development. We welcome the historic agreement reached at the United Nations Third International Conference on Financing for Development held in Addis Ababa in July 2015, in which countries agreed to an array of measures aimed at widening the revenue base, improving tax collection, and combatting tax evasion and illicit financial flows. The modality of domestic resource expenditures is also important; governments must establish national control mechanisms and transparent public procurement frameworks, while ensuring equal participation and transparency in budgeting processes.

Some countries with positive macroeconomic prospects show sizeable space for increasing public spending on health by as much as 1 percent of GDP, even without increasing the share of health in the budget (Barroy et al 2016). In the case of the Democratic Republic of Congo, public spending on health could almost double if the favorable economic growth forecasts are realized (Barroy et al 2014). Likewise, countries like Myanmar, which is growing at 6.4 percent, will also increase public spending on health without altering the budget share. In countries like Guinea, however, economic stagnation following

the Ebola epidemic will result in contraction in overall revenue growth and thus also reduce public spending on health (Barroy et al 2016).

Strengthening domestic resource mobilization, however, is not just a question of raising revenue; it is also about designing a tax system that promotes inclusiveness, encourages good governance, matches society's views on appropriate income and wealth inequalities, and promotes social justice. Taxation, which is integral to strengthening the effective functioning of the state and to the social contract between governments and citizens, provides governments with the funds needed to invest in development, relieve poverty and deliver public services. It offers an antidote to aid dependence in developing countries and provides fiscal reliance and sustainability that is needed to promote growth. We believe that governments should apply progressive tax systems, make collection processes more efficient, and increase tax compliance (IMF 2015). Through tax reform, countries can broaden their tax base and work towards integrating the informal sector with the formal economy.

How Much Is Enough?

There is no single target tax ratio that would be appropriate to all countries. However, there is increasing evidence that it is hard to secure lasting economic growth with a tax ratio below 15 percent of GDP (Gaspar, Jaramillo and Wingender 2016). Despite marked increases in tax ratios in the last two decades, in which median tax revenues in low-income countries increased by 4.3 percent of GDP (IMF, OECD, WBG, 2016), the median tax ratio level in low-income countries remains at only 13 percent, which is just two-fifths of the level in OECD countries (33.8 percent). Half of sub-Saharan African countries still mobilized less than 17 percent of their GDP in tax revenues in 2014, below the minimum level of 20 percent that the UN considered necessary to achieve the Millennium

Development Goals. Tax revenue as a percentage of GDP for IDA countries (70 out of 77 for which data is available) shows that, in 2014, 30 countries collected less than 15 percent and 55 countries less than 20 percent of their GDP (IMF 2014).

Experts agree that there is considerable potential to increase tax revenue in developing countries (European Parliament 2014). An econometric analysis (comparing performance in differing countries) suggests that many low-income countries could increase their tax ratios by 2–4 percent of GDP (IMF 2011). A common element of success stories is sustained political commitment at the highest levels: even administrative reforms can prompt strong opposition. Reforms must be entrenched, however, to avoid subsequent slippage (McIntyre 2007). As countries move to strengthen their tax systems and improve revenue collections, development partners may lend support. OECD, for example, has supported governments by fielding “tax inspectors without borders”, and the IMF is providing technical assistance in the revenue area in some 130 member countries.

Earmarked Taxes to Finance Preparedness

Another way in which countries can create additional fiscal space for preparedness is through earmarking. The basic idea is to use specific taxes for specific purposes. This can take the form of specific taxes for specific end uses (such as mandatory health insurance premiums), specific taxes for general, unspecified uses (such as alcohol taxes) or general taxes for specific uses (such as devoting a fixed percentage of general taxes to a specific program). A distinction can also be made between “actual” and “notional” earmarking. Actual earmarking is a rigid version, in which funds are channeled mechanically to their assigned use (health or public transportation or whatever else), with no possibility of adjustment based on changing circumstances. Notional earmarking builds in more flexibility in

the allocation of funds, but for that reason is less protective against subsequent diversions.

Advantages of Earmarking

Earmarking is a contentious issue. We will start by considering several advantages policy makers have found in earmarked taxes. First, visibility associated with earmarked taxes serves to highlight the priority that the government accords to the relevant policy issues. Where domestic revenues are being collected for new health services or programs that are not well known or understood, earmarked taxes may provide an opportunity to enhance the public's understanding of the costs associated with a service delivered. Second, earmarked taxes for health can protect revenues destined for social services that might otherwise be allocated elsewhere during the policy and budget process. This is particularly relevant for countries with weak oversight of budget expenditures and where special interests and corrupt practices can influence budget allocations. Third, where earmarked taxes facilitate a tighter linking between financing for health and services delivered and received, public spending will achieve greater allocative efficiency. This will also facilitate a more transparent budgeting process and enhance the public's perception that taxes received by the government are tied to a perceivable social benefit. In addition, where these ties are overtly evident, political pressure may enhance accountability of governments to render services promised (Cashin et al 2017).

Thus, depending on the political and economic context, countries may find that earmarked taxes can increase revenue protection, allocative efficiency, public compliance, government accountability, and people's understanding of the costs associated with services, without excessively constraining funding flexibility.

In situations where public finance management processes offer little opportunity for

mid-cycle adjustments and where potential revenues from earmarked taxes can be placed in an extra-budgetary fund, earmarked taxes for health may actually enhance governments' ability to respond and augment budgeting allocations for health. In some circumstances, earmarked taxes can be a means of counter-acting negative externalities associated with certain high risk behaviors, such as smoking and alcohol consumption, by increasing funding for the associated health ailments and costs (Cashin et al 2017; Tandon et al 2014). The long-term impacts of these taxes on health-risk behaviors remain to be confirmed. However, recent country examples show that such earmarked taxes ("sin taxes") may initially decrease people's incentives to purchase health-compromising products, especially cigarettes. These taxes potentially reduce people's risk of suffering diseases associated with consumption of the dangerous products (Tandon et al 2014). However, the fact that sin taxes help reduce the consumption of, for example, tobacco and associated disease risks has nothing to do with whether the taxes are earmarked or not. Indeed, most countries have sin taxes which are not earmarked to health.

The Downsides of Earmarking

Reduced flexibility, economic distortions, and the pro-cyclical nature of earmarked taxes are some of the problems noted in the literature. Earmarking by definition reduces flexibility in the budget process, and could also reduce the influence of policy making on budget allocations. For example, budget processes that are shaped by mid-term policymaking may become less flexible, and countries with weak mechanisms for ensuring coordination across different social sectors may encounter increases in fragmentation of financing, adverse distributional effects, and potential inability to increase revenue. Earmarking can discourage the use of the commodity or activity being taxed, and thus create a distortion in the economy.

In addition, since budgets are fungible, earmarking one revenue source (channeling it to a health initiative, for example) could be offset by cuts in other sources, as a result of which earmarking would not bring about a significant and sustained increase in resources for the program or initiative being supported by the tax (Cashin et al 2017). Indeed, Barro et al (2016), in a qualitative review of 35 studies on fiscal space for health, finds little evidence to support the prospective role of earmarked funds in expanding fiscal space for the health sector. Instead, it identifies economic growth, budget reprioritization, and efficiency measures as the main drivers of fiscal space for health expansion.

Earmarking in Country Practice

Real-world practice does not necessarily follow policy experts' prescriptions. Notwithstanding the advantages and drawbacks of earmarked taxes as analyzed in the literature, at least 80 countries worldwide utilize earmarked taxes for health in some capacity. Some countries utilize earmarked taxes for health to finance a national health initiative, such as Ghana, Estonia, and the Philippines, which earmark part of their revenues for national health insurance. South Africa utilizes earmarked taxes for health to mobilize domestic resources for the national HIV/AIDS epidemic. More than 20 countries earmark tobacco tax revenue specifically for health. Several countries earmark all their revenues for health, while others, like Mongolia, Thailand, Qatar, Tuvalu and Bulgaria, earmark a small percentage. Some countries, like Thailand and the Philippines, earmark a small portion of tax revenues from alcohol to health (Cashin et al 2017, Tandon et al 2014, WHO 2009).

Country experiences of revenue generation with earmarked taxes vary. A study of eleven countries by the Japan-World Bank Partnership Program on UHC examined the relationship between political commitments to UHC, financial

commitments facilitated by earmarked taxes for UHC, and the generation of revenues for UHC. The analysis turned up little evidence that earmarked financing is associated with enhanced domestic revenues for UHC, overall (Maeda et al 2014). However, some countries showed quite positive results with earmarking. Thailand, for example, which has a substantial informal sector, has struggled to raise sufficient domestic revenues for UHC via payroll taxes alone, and has found success with earmarked taxes on general revenues (Maeda et al 2014).

WHO case studies on earmarking tobacco taxes in Botswana, Egypt, Iceland, Romania, Poland, Philippines, Vietnam, Thailand, and Panama indicate some potential for increased domestic revenues. However, this potential must be contextualized by the share of government expenditure on health generated by this financing mechanism—from a low of 0.001 percent in Poland to a high of 1.3 percent in Panama. The introduction of tobacco sin taxes in the Philippines has been associated with an increase in revenues for health. However, some difficulties during the application of new revenues towards health services have arisen both in the Philippines and in Botswana. The problems result primarily from weaknesses in the public finance management processes (Cashin et al 2017).

Two studies provide precise quantification of the potential effect of earmarked taxes. A fiscal space study undertaken in Peru notes that the tax rate on tobacco products, which is just 37.8 percent of the retail price, could generate fiscal space equivalent to approximately 0.02 percent of GDP if the tax rate on tobacco products were increased to the average price in Latin America (Matus et al 2015). Another study finds that increasing excise taxes on tobacco in Gabon could expand revenues by 0.05 percent of GDP (Saleh et al 2014).

The Bottom Line: Earmarking for Preparedness Could be a Reasonable Option

We believe that countries should explore the use of earmarked taxes to generate additional fiscal space for preparedness. This would be especially important in countries with low tax-to-GDP ratio or where certain sectors are not taxed. Industries and activities that contribute to increasing pandemic risk, such as antibiotic use for growth promotion in meat production, and those that stand to gain the most from investments in pandemic preparedness, such as tourism, are potentially good candidates for earmarked taxes. Even though budgets are fungible, and over the long-term increases in earmarked taxes may be offset by cuts from other sources, earmarking could play an important role in raising the profile and visibility of the issue. It would be important, however, that countries examine the advantages and downsides of introducing new earmarked taxes, and take a considered decision based on their specific-country contexts.

RECOMMENDATION 6: To increase fiscal space, national governments should examine ways of generating incremental domestic resources to finance preparedness, whether by (i) improving overall tax design and collection; or (ii) introducing earmarked taxes where they might be an effective way to generate additional resources.

Mobilizing Development Assistance for Preparedness

For most countries, domestic resources are the best solution for financing preparedness. However, development assistance will also play a powerful role in creating and strengthening preparedness capacities in some contexts. It is important that development assistance for preparedness be focused on the right countries and activities, and that the delivery of donor funds be

well harmonized across donors and well aligned with national priorities. Whenever possible, donor support must be used deliberately to catalyze sustainable domestic financing.

The G7 nations and many individual donor countries have made explicit commitments to support preparedness. By delivering on these promises, donor countries will reinforce a critical global public good. Many donor countries and organizations are already engaged in financing preparedness efforts at country and global levels (Box 5.1).

Priorities for Donor Investments in Preparedness

We propose that donors adopt the following three priorities for funding preparedness activities:

1. Capital investments or one-off expenditures in poorer countries, where such expenditures can work catalytically. Wherever possible, beneficiary countries should then be prepared to shoulder recurrent expenditures.
2. Regional spending on shared resources. Funding at this level can be critical for functions and tools such as cross-border disease surveillance and laboratory facilities. While critically important, these are sometimes difficult to fund from domestic budgets.
3. Creating baseline preparedness and prevention capacities in fragile and conflict-affected states, war zones, or other settings where these basic capacities are simply absent and must be built from the ground up, before meaningful preparedness activities can even begin.

In all cases, development should seek to support the financing of preparedness through the national health security plans and budgets

BOX 5.1 Current Donor Support for Preparedness

Donors contribute significant sums to strengthening prevention, preparedness and response capacities in developing countries. Data for 2015 from OECD's Creditor Reporting Survey (CRS)¹ and the G-Finder survey,² show that the top 9 donors—United States, United Kingdom, Germany, Canada, Japan, Australia, Korea, Norway³ and the Bill and Melinda Gates Foundation—contributed over \$4 billion to preparedness activities in 2015 alone.⁴ This funded seven major preparedness functions: capacity strengthening, response, treatment and case management, governance and stewardship, education and behavior change, activities in the veterinary sector, and Research and Development (R&D).

The United States accounts for over 60 percent of total disbursements, followed by the United Kingdom (13 percent), and the Bill and Melinda Gates Foundation (10 percent). The remaining donors—Canada, Japan, Australia, Korea and Norway—account for the balance 17 percent.

Countries in sub-Saharan Africa are by far the largest beneficiaries. Most of the disbursements from the United States, the United Kingdom, and Japan go to Nigeria, which is also the second largest recipient of donor funds from Canada and Norway. Nigeria, which received \$220 million in 2015, is the largest recipient of all donor flows for preparedness, followed by Uganda (\$89 million), Kenya (\$75 million), Malawi (\$66 million), India (\$64 million), Tanzania (\$64 million), South Africa (\$62 million), Mali (\$61 million), Afghanistan (\$58 million) and Ethiopia (\$57 million).

Forty-two percent of donor financing went to R&D, followed by capacity strengthening (31 percent), and response (10 percent). The balance 17 percent supported treatment and case management, governance and stewardship, education and behavior change and agriculture and unspecified activities. Of the \$2.5 billion non-R&D flows, \$1.8 billion went to support activities that focused on malaria (\$754 million), Ebola (\$441 million), polio (\$313 million), tuberculosis (\$214 million), and Avian Influenza (\$36 million).

¹ The CRS database records individual development assistance flows from OECD donor countries to developing countries. The database is organized by recipient country, recipient region and sector of disbursement, such as health or agriculture, and categorized by different taxonomies relating to that sector. For the health sector, the first sub-category is basic health or health general, followed by purpose, such as infectious disease control or health personnel training.

² The G-Finder database is compiled from a survey on country R&D spending on Neglected Diseases. The survey includes information on the disease and differs from the CRS in that it details investments to domestic research institutes and think-tanks as well as investments in R&D in developing countries.

³ The analysis considers eight donor countries that account for 85% of total health development assistance disbursements for 2015 in the CRS database, and one philanthropic donor, the Bill and Melinda Gates Foundation, due to high levels of funding for R&D reported in the G-Finder database.

⁴ Estimated duplicated reported spending between the two databases is deducted from the CRS database.

emanating from the JEE process, and use the JEE criteria as benchmarks of achievement. Wherever possible development partners should seek to secure commitments from recipient governments around matching and ongoing funding so as to maximize the impact of the development assistance.

The ongoing JEE and planning exercises offer enhanced opportunities to donors and recipients alike in channeling development assistance resources to critical areas of preparedness. The costing and financing exercises conducted by countries after JEEs provide an objectively assessed and validated enunciation of resource

EXHIBIT 5.1 Output Indicators Can Demonstrate Progress Against Specific Security Activities Identified as Priorities in the NAPHS

Example: D1.1. Laboratory testing for detection of priority diseases

Target	<ul style="list-style-type: none"> Real-time bio-surveillance with a national laboratory system and effective modern point-of-care and laboratory-based diagnostics 	
As measured by	<ul style="list-style-type: none"> A nationwide laboratory system able to reliably conduct at least five of the 10 core tests 	Indicators could be related to the overall measure or to the actual implementation of specific action items identified in the plan
Action items to move from JEE level of capacity 3 to 4	<ul style="list-style-type: none"> Ensure access to networks of national and international laboratories established to meet diagnostic and confirmatory laboratory requirements and support outbreak investigations for events specified in Annex 2 of IHR (2005) Procure diagnostic equipment, supplies and reagents to ensure relevant diagnostic capacities to perform core tests of priority diseases (5 or more of the 10 core tests) 	

Source: JEE Assessment Tool, CDC Library of Milestones, APSED Guidelines, Existing Country Plans.

requirements for strengthening preparedness. The rigorous process of diagnostic, planning, and costing initiated with the JEE assessment should serve to strengthen the investment case that recipient countries need to make for additional funding support. Likewise, it should also give confidence to donor countries that their support will fund gaps identified by objective external experts.

Closely related is the issue of measuring preparedness. We suggest using a mix of indicators that would be useful, both for a country's internal purposes in monitoring and improving system performance, and as a way for partners to understand how a country is progressing in its capacity to prevent, detect, and control disease outbreaks. This could include some combination of process, output and outcome indicators. Process indicators are those that assess countries' progress in planning, costing, and financing preparedness activities. For example, a process indicator could be a completed NAPHS, with clear timelines, ownership, and implementation plans. Output indicators, which measure a country's progress in implementing specific activities identified in the NAPHS, could be linked to the

prioritized activities identified by the NAPHS that could move a country from one JEE level to the next. Exhibit 5.1 provides an illustration. And finally, outcome indicators, which are tied to the impact that outputs have on infectious disease outbreaks, could include the frequency and impact of infectious disease outbreaks in the period following activity implementation, compared to a control period before implementation.

Strengthening Regional Preparedness

A disease outbreak in a country has costly consequences not only for itself, but also for its neighbors and the global community. Knowing this, an individual country acting in its own interest and by itself may be motivated to underinvest in the prevention of infectious diseases, because: (i) it would expect its neighbors and the global community to share in the costs of preparedness since all neighboring countries would stand to benefit from investments by each country in that neighborhood cluster; and (ii) it would expect richer countries to invest, since they stand to lose relatively more in the event of an outbreak. Regional preparedness provides

BOX 5.2 The West Africa Regional Disease Surveillance Systems Enhancement (REDISSE) Program

The REDISSE Program is an interdependent series of projects to strengthen national, regional and cross-sectoral capacity for integrated disease surveillance and response in West Africa. It is financed by a combination of IDA credits and grants, with co-financing through multi and single donor trust funds. The Program allows countries to access both country and regional IDA financing, such that for every dollar of IDA allocated to the Program from the country IDA envelope, one to two dollars is allocated from the regional IDA envelope.

Total proposed financing for the REDISSE Program is estimated to be \$450 million of which \$261 million has been committed under the first two projects in the Program in support of preparedness activities in Guinea, Sierra Leone, Senegal, Guinea Bissau, Liberia, Nigeria and Togo (Benin and Cote d'Ivoire are confirmed to join in the third project). In order to ensure that the human-animal-environment interface is addressed and the One Health approach is central to project design and implementation, the Program has been developed jointly by the World Bank's Health and Agriculture practices with two main objectives: (i) to address systemic weaknesses within the animal and human health systems that hinder effective cross sectoral and cross border collaboration for disease surveillance and response; and (ii) in the event of an eligible emergency, to provide immediate and effective response to said eligible emergency. Areas supported by REDISSE include surveillance and information systems; strengthened laboratory capacity; epidemic preparedness and rapid response; workforce training, deployment and retention; and institutional capacity building for project management, coordination and advocacy.

The REDISSE Program builds upon partnerships at the global and regional level and promotes partnership and collaborative approaches at the national and subnational levels. Consultations with other partners have been extensive, and includes WHO, OIE, US CDC, USAID, BMGF, Canada and China.

a classic public good—it mobilizes investments that the market will not and in which countries under-invest. And it is cheaper to develop high-level expertise at the regional multi-country level rather than at the level of an individual country. Thus, one priority area that we have identified for investment by development partners is regional preparedness.

Recent events have revealed gaps in preparedness at the regional level in some settings, highlighting the containment opportunities that can be lost when protective systems at this level fail. The Ebola outbreak in West Africa

in 2014–15 not only exposed weaknesses in the public health surveillance, preparedness, and response systems of the three affected countries; it also emphasized the importance of regional collaboration and underscored the need for a more harmonized approach to disease surveillance and response for potential cross-border disease outbreaks. The Ebola epidemic began in Guinea, but rapidly spread to neighboring countries. Containment was hampered by the absence of systematic collection, reporting, and exchange of surveillance and laboratory data across national borders in real time.

Recognizing this, the World Bank is investing \$450 million in West Africa in the Regional Disease Surveillance Systems Enhancement (REDISSE) Program (Box 5.2). The program finances regional-level policy dialogue and activities that will promote information exchange, timely collective action, and efficient use of country and shared resources, such as reference labs, training institutions, and commodity stockpiles, for disease surveillance and response. It also provides countries with financing that is under their direct control to rapidly address identified priorities. This mechanism should help countries respond to potential pandemics at the first signs of the outbreak.

WHO is also providing Guinea, Liberia, Sierra Leone, and other West African countries with support to develop and strengthen regional disease surveillance and response. WHO assists these countries in assessing, restructuring, and strengthening integrated country-level preparedness systems.

The World Bank is also supporting a regional laboratory-strengthening initiative in East Africa. The \$129 million East Africa Public Health Laboratory Networking Project is helping Kenya, Rwanda, Tanzania, Uganda and Burundi establish a network of efficient, high quality, accessible public health laboratories for the diagnosis and surveillance of TB and other communicable diseases in the East African Community member states. The project supports 32 facilities across the five countries, of which 26 are hospital-based satellite laboratories located in cross border districts, with the aim of enhancing access to diagnostic services, expanding disease surveillance and emergency preparedness efforts, and serving as a platform for learning, knowledge sharing, and training.

We believe that development assistance should further emphasize regional approaches to strengthening preparedness. Increased financial flows in support of regional initiatives will help countries reap economies of scale and other

efficiencies by acting collectively in pursuit of common objectives through trans-border collaboration and cooperation. The World Bank already dedicates IDA resources for regional projects and provides them to countries on a concessional basis, in order to encourage countries to adopt regional solutions to shared national problems. We encourage other development partners to follow suit.

Other development banks can make especially important contributions. Regional multilateral development banks are well placed to support regional initiatives on preparedness. Development banks can see that features such as regional laboratory networks and disease surveillance systems are critical components of countries' risk management infrastructure, and these banks can plan their lending and investments accordingly.

The IWG further proposes that a discussion be initiated on including preparedness as an individual item in the Development Assistance Committee (DAC). Such a move would enable better monitoring of development partners' support for preparedness. It would facilitate holding development partners accountable for the commitments they make and create a forum for regular discussion of preparedness financing issues among stakeholders.

RECOMMENDATION 7: Development partners should fulfill and build on existing collective and bilateral commitments to help finance preparedness in countries needing support, focusing on: (i) in-country capital investments and one-off spends; (ii) multi-country regional initiatives; and (iii) failed and fragile states where domestic resourcing is not a realistic option. To maximize the catalytic impact of their assistance, development partners should structure their support to the health security plans emanating from the JEE process and encourage national governments to match investments and commit to ongoing financing from domestic resources.

Engaging the Private Sector in Financing Preparedness

Investment in preparedness against outbreaks of infectious diseases and AMR is generally financed through the public purse. Such funding is constrained by fiscal capacity and the inevitable budget trade-offs among competing priorities. Private sector companies (including the whole range of business enterprises spanning manufacturing, services, transportation, agriculture, and natural resources) have much to lose from disease outbreaks, but typically make little direct financial contribution to preparedness. We believe that this must change.

Business and Preparedness: Untapped Opportunities

To date, companies have generally made very limited contributions to financing preparedness. There are two broad reasons for this. First, private sector companies lack adequate awareness of the risks of infectious outbreaks (including drug-resistant strains), and tend to underestimate those risks. Only those that have directly experienced disruption to customers, supply chain, and workforce from such causes attach much weight to such risks. Second, private sector companies find it difficult to justify investments in public goods, such as national disease surveillance systems, national vaccination programs, national laboratory networks, and national emergency operations centers, because these do not generate profits for their shareholders. It is therefore important that a case is made to show that preparedness is a good investment for business—which is likely to attract attention of private companies. Private sector companies do fund philanthropic/corporate social responsibility activities, but these are typically limited in scale.

Where a company is aware of the risks from infectious diseases, it might well make specific

investments in its own preparedness—e.g., protecting its workforce or enhancing the resilience of its supply chain—where the private benefits justify the spend, but it is unlikely to invest significantly in broader public goods, unless industry associations or the government can overcome the collective action problem. While the lack of awareness can be tackled, the fact that much of pandemic preparedness involves the creation of public goods is intrinsic—and why most public health spend is financed through government. A deeper understanding of shared value and collective impact of investments in preparedness should be leveraged to shift this dynamic.

Finding Solutions

There are a variety of possible solutions to this problem, though none is a “silver bullet.” First, it is important to build greater awareness of disease outbreak risks among private sector companies. This is a prerequisite for any other action, since making companies more aware of the risks will likely make them less resistant to potential taxes or regulations. It will encourage them to reinforce their own resilience, and will facilitate their engagement in preparatory planning with government agencies, particularly where they have relevant assets or capabilities. Greater awareness may be achieved through such means as observing “pandemic awareness” days and running simulation exercises.

Second, private sector companies can be required to invest in certain aspects of preparedness through regulation. In other arenas, the financing of risk mitigating actions is largely achieved through imposing the costs on the private sector through regulation. For example, banks are required to commit vast amounts of capital and spend significant sums to reduce the risk of financial crises, and often pay levies to fund the regulatory agencies that oversee them (Box 5.3). In theory, similar approaches could be applied to mitigating the risks of disease

BOX 5.3 Deposit Insurance

Explicit deposit insurance is a measure implemented in many countries to protect bank depositors, in full or in part, from losses caused by a bank's inability to pay its debts when due. Deposit insurance institutions are for the most part government run or established, and may or may not be a part of a country's central bank. In some instances, they may also be private entities with government backing, or completely private entities. Many national deposit insurers are members of the International Association of Deposit Insurers (IADI), an international organization established to contribute to the stability of financial systems by promoting international cooperation and to encourage wide international contact among deposit insurers and other interested parties. According to the IADI, 125 countries have instituted some form of explicit deposit insurance.

The United States is one of the first countries to have implemented a deposit insurance scheme. The Federal Deposit Insurance Corporation (FDIC), which is a government corporation, provides deposit insurance for depositors at US banks. The FDIC was created by the 1933 Banking Act during the Great Depression to restore trust in the American banking system. More than one-third of banks failed in the years preceding establishment of the FDIC, and bank runs were common. Since the passage of the Dodd–Frank Wall Street Reform and Consumer Protection Act in 2011, the FDIC insures deposits in member banks up to US \$250,000 per ownership category. The FDIC and its reserves do not receive public funds; member banks' insurance dues are the FDIC's primary source of funding.

Several African countries employ deposit insurance institutions. In Uganda, deposit insurance is part of the National Bank. In Sudan and Kenya, deposit insurance institutions are part of their Central Banks. Zimbabwe utilizes a deposit insurance countries corporation. In all cases, these institutions are primarily funded with premium levies collected from member institutions. In Zimbabwe, for instance, the current annual premium rate is 0.2 percent of average eligible deposits, and the premium is paid on a quarterly basis. The notion of requiring the banking industry to invest in mitigating their own risks is quite well established, even in low-income countries.

outbreaks. Companies could be required to ensure a basic minimum level of protection for their employees. Companies whose activities contribute to the risk of outbreaks—such as food producers—could be required to invest in capabilities and infrastructure to reduce such risks. The challenge here is that in many of the countries where the risk of infectious disease outbreaks is high, the proportion of people employed by the formal private sector is very small, and the market share of such companies in key industries like food production is

also minute. Imposing regulations like those described would have little real impact in reducing risks (and to the extent that it disadvantaged the formal private sector, could increase the risk).

Third, governments can encourage or mandate corporate social responsibility (CSR) spending dedicated to preparedness. India, for example requires larger companies to commit at least 2 percent of their profits to corporate social responsibility. Indonesia has also mandated

CSR. Further, governments can encourage corporate philanthropy by giving public recognition or matching funds for private contributions toward preparedness. The challenge, however, is that companies typically prefer to devote their philanthropic activities to projects with more visible outcomes.

Finally, governments can work with companies that can leverage existing assets and capabilities to contribute directly to preparedness. One example that is already being pursued is the use of cellular tower networks to provide distributed refrigeration capacity for vaccines. Another example is private sector healthcare providers, who must be integrated into national preparedness arrangements to ensure comprehensive disease surveillance and coordinated response planning. This would probably require a combination of regulation and practical cooperation, but in this way, private sector healthcare providers could contribute “in kind” to financing preparedness. Likewise, companies specializing in logistics and supply chains must also be integrated into strengthening delivery systems, which are an integral part of preparedness.

Leveraging such corporate assets is a potentially powerful approach, since the private sector has significant infrastructure and capabilities, but making it work requires companies to understand the risks and preparedness requirements, and governments to understand what companies can contribute—plus an atmosphere of trust and cooperation.

Vehicles for Business Collaboration in Preparedness

Several alliances, forums, and other mechanisms exist that can be mobilized to help promote and coordinate private-sector engagement in preparedness efforts at global, national, and local levels. On the global stage, the World Economic Forum (WEF) may be an important facilitating

platform. In local settings, chambers of commerce may serve as coordinating vehicles.

The Private Sector Roundtable (PSRT) was instituted in 2015 to mobilize industry to help countries prepare for, detect, and respond to health-related crises, and strengthen systems for health security. The PSRT engages with governments and companies in the health care, communications, energy, finance, technology, transportation, logistics, and other sectors to support countries in reaching the goals of the GHSA’s 11 Action Packages. PSRT members align public health needs with business objectives, and are committed to leveraging their investments and infrastructure to protect employees and their families; to preserving the functioning of high quality health services for the entire population; and to maintaining assurance of economic development in the countries where they operate.

The PSRT aims to be the central touchpoint for companies seeking to contribute to the aims of the GHSA, and to coordinate its efforts to promote global health security. It has identified several GHSA Action Packages, as well as cross-cutting priorities, which align with member companies’ capabilities and which have the potential to impact several Action Packages. These include supply chain and logistics; policy development and advocacy; workforce development; partnerships; technology and analytics; and AMR.

We see a role for the PSRT in mobilizing the private sector all over the world. The PSRT is well-positioned to identify industry-specific roles and contributions during pandemic preparedness and response phases, especially among companies involved in healthcare, financial services, transportation, logistics, and public relations, as well as other firms with widespread marketing networks. We believe that the PSRT should establish national chapters in all countries, which should include multinational, national, and local industry groups.

In coordination with the public system, the national chapters of private companies should work toward building greater awareness of pandemic risks among their members, conduct periodic simulation exercises, and foster collaboration at the national and local levels for implementation of their roles and contributions of preparedness and response.

RECOMMENDATION 8: National governments should incorporate the private sector into their strategy for reinforcing preparedness, through a combination of awareness-building, direct involvement in preparedness and response planning, and regulation. Where private sector companies contribute directly or indirectly to the risks of disease outbreak and spread by the nature of their business, national governments should introduce regulations requiring such companies to invest in risk mitigation and preparedness.

Leveraging Insurance to Finance Preparedness

The role of insurance in disaster response has been increasingly recognized over the past ten years. Contrary to traditional development assistance models, in which money invariably arrives too late, insurance can be designed such that it disburses very rapidly. For instance, it has been estimated that \$1 received quickly as a drought is recognized is worth \$4 to \$5 received after the lag associated with the traditional response process. The fast delivery of money, coupled with a pre-determined contingency plan, can be very effective in saving lives and livelihoods, and reducing the negative economic impact of the crisis (Clarke and Hill 2013).

A New Science of Risk Management

Insurance is not just about financial payment at times of loss but necessarily includes a whole

system of risk identification, risk assessment, risk modelling, risk monitoring, risk preparedness, risk management, and contingency planning. Membership in an insurance scheme can include both requirements to meet certain standards of preparedness and incentives to further improve preparedness and reduce risk.

The global catastrophe re/insurance market has been transformed over the past thirty years by an engagement with science and engineering. The process of catastrophe risk modelling has led not only to far greater knowledge of the hazards faced, but also of the property and people at risk and their vulnerability to the hazard events. The culture of active risk management encoded into insurance of domestic, commercial, industrial, and technical risks—for example, refusing coverage if sprinklers are not installed or rewarding a firm that installs them with premium discounts—has spread throughout the industry. This greater knowledge has allowed the development of financial models that enable firms to assess the comparative cost and benefit of different risk management strategies. Metrics such as average net loss cost, the worst loss that may be expected every 10 years (a measure of impact on annual result), and the worst loss that can be expected every 200 years (a measure of capital safety) have been broadly adopted. Regulators and rating agencies have embraced these metrics. Overall, the insurance industry has advanced in technical and scientific sophistication far beyond the earlier periods of its history. This has strengthened the industry financially—and made it an especially important partner for preparedness.

Disaster Response Insurance: Regional Initiatives

The value of disaster response insurance in the natural catastrophe field is proven. The first regional disaster response scheme, the Caribbean Catastrophe Risk Insurance Facility

(CCRIF) was launched in 2007 offering insurance to governments against tropical cyclones and earthquakes. CCRIF is effectively a mutual insurance entity, operated on behalf of its member governments and protected by the international reinsurance market. Over its 10 years of operation, CCRIF has paid out almost \$70 million over 22 separate claims, in every case money being paid to member governments within 14 days of the event occurring. Governments receive confirmation that payment will be made within days of an event occurring, allowing them to pre-plan rather than wait for an uncertain claim payment paid at an unspecified time in the future.

Likewise, the African Risk Capacity (ARC), was created in 2014 to offer insurance policies to African countries against drought and tropical cyclone. As part of the design of ARC, an Agency of the African Union was created to help countries understand their risk, design appropriate insurance solutions, make appropriate contingency plans and, after a loss, review the contingency plans and monitor their implementation. Countries are not allowed to buy insurance products unless they have been through this process, with contingency plans and product design signed off by ARC Agency representatives. In 2014–15, ARC paid three West African countries a total of \$26 million in response to a drought event.

Insurance companies could potentially play a significant role in stimulating investment in preparedness. Pandemic insurance schemes do not directly contribute to financing preparedness, but are designed to ensure the availability of financial resources should an outbreak occur, which can facilitate rapid containment and overall resilience. The most powerful benefits of insurance from a risk reduction perspective tend to be: a) the additional insights that are generated by insurance providers into risk drivers and mitigants; and b) the incentives created for governments and private sector companies, which will be incentivized to take action to reduce the risks and thus the premiums.

Insurance Innovation: The Pandemic Emergency Financing Facility

During 2015 and 2016, the World Bank and other partners developed the PEF, a parametric insurance fund across a range of diseases focused on IDA countries, with premiums being funded by donor nations. Through this initiative the World Bank and its partners have worked through many of the issues around the framework within which insurance fits, the structures of parametric triggers, the modelling of the risks, and the finding of insurance capacity. But all agree that the PEF is a pilot, a first step. For example, the PEF does not directly incentivize recipient countries to invest in preparedness in order to reduce premiums; is focused just on IDA countries; and has a limited basis of (re) insurance carrier support. Finally, the PEF was never intended to focus on the private sector operating in the risk regions, and so is silent on the opportunities to provide business interruption type insurance into the private sector, again to incent preparedness.

In that context, there is an opportunity to build on this pilot to develop a PEF 2.0 that directly incentivizes recipient country investment in preparedness by involving recipient countries in paying some portion of the premiums. This may mean broadening the focus beyond IDA countries and focusing on those that have already achieved a certain minimum standard against the JEE criteria. The priority in countries with fundamental gaps in preparedness and the underlying health system infrastructure should be to fund the rectification of these weaknesses.

In addition, there is also an opportunity to extend the delivery of parametric insurance to the private sector. Broader take-up business interruption insurance that covered infectious disease risks would simultaneously increase economic resilience and create greater awareness of infectious disease risks among private sector leaders. The product offering would rely

on the same data and analytical tools as the offering to governments. Here the challenge is to stimulate the demand since most companies underestimate the risks to their businesses.

New partnerships between multilateral organizations and insurance firms may accelerate innovation. A promising collaborative platform is the Insurance Development Forum, set up in 2015 during the Paris Climate Summit as a public/private partnership between the insurance industry and international organizations.

RECOMMENDATION 9: The Insurance Development Forum, the World Bank, and other partners should work together to: (i) develop the next iteration of the Pandemic Emergency Financing Facility (PEF 2.0) that specifically ties recipient countries' investments in preparedness to relief of their contributions to PEF 2.0 premiums; (ii) deliver maximum participation from the insurance markets to provide capacity for PEF 2.0; and (iii) investigate how insurance for business interruption resulting from disease outbreaks can be provided to private sector companies in target countries.

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Annex to Chapter 5

TABLE A5.1 Donor Flows for Preparedness (Excluding HIV), US\$ million (2015)

Country	Preparedness	R&D	Total
United States	1,552	933	2,485
United Kingdom	404	118	522
Germany	116	48	164
Canada	132	3	135
Japan	142	10	152
Australia	69	19	88
Korea	18	0	19
Norway	42	6	48
BMGF		419	419
Total	2,475	1,556	4,031

TABLE A5.2 Donor Flows by Function (excluding HIV), US\$ million (2015)

Function	United States	United Kingdom	Germany	Canada	Japan	Australia	Korea	Norway	BMGF
R&D	973	187	89	7	10	19	1	6	419
Capacity Strengthening	657	261	68	90	89	43	14	11	0
Response	373	6	2	3	13	3	0	1	0
Treatment/Case Management	46	46	1	0	0	0	0	5	0
Governance/Stewardship	24	8	0	19	0	0	0	0	0
Education & Behavior Change	7	0	0	5	0	0	0	0	0
Agriculture	1	7	5	4	16	3	1	0	0
Unspecified	404	8	0	6	23	20	2	26	0
Total	2,485	523	165	134	151	88	18	49	419

6

INCENTIVIZING COUNTRIES TO PRIORITIZE ALLOCATION OF FUNDS TO PREPAREDNESS

A substantial reduction in the threat of pandemics can only happen if countries choose to invest and strengthen their national preparedness systems. To make such investments, governments need to be convinced that the costs associated with strengthening public health systems are a necessary expenditure in the context of competing demands for social and economic investment. The current under-preparedness of many countries suggests that this case has not been well made, despite the well-documented socioeconomic risks associated with infectious disease outbreaks.

It can be challenging to convince politicians to spend money to help avoid something and cause it not to happen; after all, it is hard to claim credit for an investment that is successful only if nothing happens as a result. It is important, therefore, that Ministers of Finance see and feel the results of investments in preparedness in the present even as the same investments contribute to the prevention of ill effects later. One way of doing this is by developing indices or measures based on preparedness that influence the inflow of private capital. Another way is by using measures of preparedness to influence the flows of development assistance, such as from the concessional financing from the World Bank.

Assessing Economic Vulnerability to Infectious Disease Outbreaks

Infectious disease crises can have substantial effects on the economic stability and prosperity of countries they affect. Recent experiences demonstrate the macro-criticality of such outbreaks across a range of economic contexts. The countries hardest hit by the 2014–15 Ebola outbreak in West Africa suffered losses of approximately 5 percent of GDP (The World Bank 2015), whilst the 2015 outbreak of MERS in South Korea resulted in over \$1bn in lost economic activity (US Department of State 2016). Similar experiences followed the outbreaks of H1N1, SARS and Zika, and recent estimates put the expected global losses resulting from pandemic influenza at \$570 billion each year this century, about 0.7 percent of global GDP. Of note, none of these assessments include the substantial costs of failing to contain an outbreak that subsequently goes on to become endemic in a population, as happened with HIV, potentially resulting in losses an order of magnitude greater.

Despite the huge economic and financial impact of infectious disease outbreaks, the scale of these impacts is not well known to decision makers responsible for prioritizing investment for public goods. The World Bank and others

have produced occasional thematic assessments of pandemic risk; however, these efforts have been sparse and not systematically linked to country policy and budgeting processes. The prevailing picture around macroeconomic assessments of risk and pandemic risk is one of neglect. An analysis of macroeconomic assessments undertaken of fifteen countries affected by infectious disease crises showed a tendency for economists to overlook a country's vulnerability to infectious disease outbreaks, despite such assessments frequently recognizing in retrospect the damage caused by such events (Sands et al 2016).

Several factors may contribute to this 'blind spot', including a lack of awareness amongst macroeconomists of the scale of infectious disease risk, a tendency to focus on near-term risks of economic stability and a lack of familiarity with bio-epidemiological inputs that might inform macroeconomic risk models. Another reason is that pandemics are rare events, making the prediction of their occurrence relatively difficult. Whatever the causes, the absence of infectious disease risks in macroeconomic assessments has the effect of depriving this area of the fiscal and policy attention that it warrants.

For governments, and specifically ministries of finance, to appropriately prioritize investment in pandemic preparedness, the scale of risk associated with infectious disease crises must be made visible and salient. Historically, however, the risk associated with such outbreaks has been misperceived and mispriced in both national accounts and capital markets, where there have been notable market failures in risk pricing and transfer. Following the outbreak of SARS in 2004, for instance, disputes arose between firms and their insurers as to whether the resulting losses were covered by business continuity policies. Following legal action, most insurers agreed to cover some contingent losses; however, many then moved to explicitly exclude losses arising from infectious disease outbreaks from future cover (Reuters 2016).

Sovereign Credit Rating

The assessment of economic vulnerability to infectious disease outbreaks could be combined with other financial risks to the economy and be incorporated into a broader macroeconomic analysis. Credit rating agencies (see Box 6.1) do consider political instability and other socio-economic factors, but pay very little attention to a country's susceptibility to health emergencies. Increased government expenditures during infectious disease crises, coupled with decrease in revenue (from downturns in the economy), potentially affects the ability of governments to make interest payments on outstanding debt. Factoring in the overall assessment of country's economic vulnerability and policy effectiveness to risk of pandemics (such as indicators of country's intrinsic vulnerability to pandemics, state of preparedness, and composition of industry sector's vulnerability to pandemics), the country's credit rating would more accurately reflect the true hazard associated with purchases of a country's debt. Such an approach has been previously used by UNDP in partnership with S&P to include Human Development Index (HDI) in devising sovereign ratings.

Credit ratings are of critical importance to governments, as they affect the cost of borrowing in the marketplace. The World Bank estimates that a ratings downgrade to sub-investment grade by one major ratings agency increases Treasury bill yields by approximately 138 basis points on average (The World Bank 2016). Losing one's rating or being downgraded thus has a huge effect on the country's ability to borrow money on the markets. Incorporation of economic vulnerability to the risk of pandemics into assessments of credit ratings would incentivize governments to invest in health systems and pandemic preparedness to boost their credit ratings. Further, making the economic threat posed by infectious diseases more visible to policy-makers and the private sector will incentivize countries to mobilize the resources to prevent and mitigate such risks.

BOX 6.1 Sovereign Credit Rating

Credit ratings predate Bretton Woods institutions (Bhatia 2002). Perhaps the first instance of independent analysis of credit worthiness was the rating, following the 1907 financial crisis, of railroad bonds by John Moody in 1909. In 1913, the ratings began to use a letter-rating system and expanded to include industrial firms and utilities (Moody's 2017). Two other indices—predecessors of Standards & Poor's (S&P), and Fitch—were established in 1916 and 1924 respectively. Today, Moody's, S&P, and Fitch are known as the “Big Three” and control 95 percent of credit rating business for rating debt instruments (Alessi 2012).

Credit Rating Agencies (CRAs) assess the default risk associated with a country's debt (Kronwald 2009). More specifically, the three main agencies—S&P, Moody's, and Fitch—determine the extent to which a government will be able to meet its debt payment obligations, and assigns a rating ranging from investment-grade (low-credit risk) to junk-grade (high-credit risk). Since these ratings provide public information and analysis of the risk level associated with country investments, countries are motivated to achieve high investment-grade ratings.

Apart from macroeconomic factors, a country's risk of default is also affected by socio-economic and political events such as war, political chaos, and deliberate decisions to hurt creditors (Moody's 2008). CRAs vary in the extent to which they measure and incorporate such country-level risk factors into their credit ratings. However, the three main CRAs consider political instability, natural catastrophes, security risks and the impact of socio-economic factors in their assessments of a country's credit-worthiness. For instance, Fitch incorporates the United Nations Human Development Index as well as the World Bank's Ease of Doing Business survey and Governance Indicators to determine the openness of the business environment and the condition of the human capital in the countries under consideration. Moody's also incorporates governance indicators, sovereign country's debt payment culture, security risks such as war, and effectiveness and stability of policy making as determinants of its sovereign rating (Tenant 2015).

By providing an intuitive, quantitative metric for a complex and multidimensional concept, indices can focus public attention, provide policymakers with additional tools to prioritize countries that require attention, and identify potential weaknesses in underlying infrastructures and institutions that would benefit from investment. They can also be used to identify outliers—countries which over-perform (or underperform) relative to national income or other metrics of interest—and to prioritize investments and capacity-building efforts accordingly. Lastly, indices can inform private sector assessments

of risk, for example, risk to supply chains and potential for business interruption. Strong scores may benefit countries via increased investments, lowered cost of borrowing, or reduced premiums for parametric or other forms of catastrophe insurance, generating additional returns to investment in national and global public health. In summary, an index can assist both the public and private sectors in identifying weak points in global preparedness, strengthen incentives to improve capacity, and help to mitigate the health and economic impacts of infectious disease outbreaks.

The Downside of Indices

There are several potential downsides to using indices to measure preparedness. First, data used for constructing the index may not be reliable and may be difficult to confirm, especially for developing countries. Second, the index may seem to be very arbitrary to some, especially to those countries that are likely to score poorly on them. Third, indices may create short-term adverse effects for poorly scoring countries, for instance if cross-border investments decline, or companies shift operations and supply chains away from areas of potential risk. These would need to be offset by donor commitment to help poorly scoring countries improve capacity and preparedness. Such a response may occur along a longer timescale, be financially inadequate, or not occur at all. Fourth, poorly scoring countries may bring political pressure against groups preparing such indices, leading to potential distortions or inaccuracies in scoring. This risk may be heightened in international organizations that lack adequate buffers between member state boards and operational/analytical functions. And fifth, countries could lose genuine engagement and goodwill if their poor JEE results are used in these indices. Therefore, a careful design of the index is essential to avoid introducing additional distortions or risks to some economies. In what follows, different aspects of what could be potentially measured in an index are discussed.

Elements to be Addressed in Assessing Economic Vulnerability to Infectious Disease Outbreaks

The factors determining a country's overall economic vulnerability to infectious disease crises can be thought of as occurring across three distinct domains: intrinsic vulnerability, preparedness and response capacity, and industry sector vulnerability. The first two categories (intrinsic vulnerability and preparedness and response

capacity) relate to the vulnerability of countries to experiencing the emergence and propagation of a pathogen through their populations. The third category relates to the vulnerability of a country's economy to the shocks to labor supply, consumption and trade that occur following an outbreak. An effective methodology for risk assessment should identify and evaluate drivers of risk in each of these components and combine them into a summative assessment of overall risk.

Intrinsic Risk

The first element, intrinsic risk, refers to the risk arising from environmental, demographic and sociological factors that predispose a country to the emergence and spread of infectious diseases. Patterns of environmental risk factors have been previously associated with the emergence of novel infectious disease agents in 'hot spots' of zoonotic transfer (Jones et al 2008). Factors such as latitude, wildlife biodiversity, co-densification of human and animal populations because of ecological transition, agricultural practices and land use changes are all associated with increased risk of infectious diseases emerging in human populations (Morse et al 2012). Substantial academic and commercial efforts have already been put into developing spatial models of emerging infectious disease risk, for example, the work funded through USAID's PREDICT program along with collaborative efforts between WHO and academic partners. Such efforts could form the basis of an intrinsic risk assessment mechanism for priority diseases and could be extended to provide a more general assessment of intrinsic risk.¹⁴

¹⁴ Currently such models incorporate historical analysis of specific infectious disease outbreaks to identify the factors associated with emergence of a specific disease. This understanding is then used to develop models that associate geographic distribution of relevant risk factors (e.g., presence of a suitable vector) with a predicted risk of emergence in a location. It may be possible to extend this approach to evaluate overall (rather than pathogen-specific risk), such that risk assessments reflect better the "unknown unknowns" associated with yet-to-emerge threats.

In addition to these physical factors, societal and demographic factors also affect intrinsic risk through their effects on human susceptibility and disease transmission dynamics. Agricultural, nutritional and sociological practices can determine the nature and intensity of interactions at the human-animal interface that may predispose to zoonotic emergence. For example, hunting, butchering and consumption of bush meat and some livestock farming practices can predispose populations to zoonotic infections. Social factors such as trends in urbanization, migration and cultural practices around burial can all alter the propensity of infectious disease outbreaks to spread through a population. Population health factors such as the rates of immunocompromised, which is secondary to endemic diseases such as HIV, or adverse health factors such as malnutrition, can also affect susceptibility to infection, and thus may need to be reflected in assessments of intrinsic risk. Finally, population behavioral tendencies, relating to trust in governmental and public health institutions, can substantially influence public responses to infection control measures and public health communications.

The final component of intrinsic risk is the underlying strength of local health systems. Strong health systems can improve the chances of routine pathogen discovery and outbreak suppression as infections may be identified in the routine course of health care delivery. Additionally, the effectiveness of all surveillance strategies is bolstered by adequate laboratory and human resources for health, capable of supporting pathogen discovery, case finding, treatment and delivery of vaccination interventions. Strong, equitable health systems can also be associated with higher levels of community engagement and trust in advance of disease crises, thus response activities can leverage pre-existing constructive relationships with communities.

Preparedness and Response Capacity

Global pandemic preparedness hinges on national systems capable of detecting and responding in a timely way to novel and emerging pathogens and potentially catastrophic outbreaks. The foundational importance of national institutions to global public health was recognized in the 2005 update to the IHR, which identified a set of basic requirements and responsibilities for governments to meet. Assessing how countries measure up is essential for planning and investment at both the national and global levels. But such assessments have proven challenging in practice.

In part, this reflects the complexity of the task. Epidemic and pandemic preparedness is demanding and requires a wide range of enabling systems and capabilities. Disease surveillance—a bedrock element of preparedness—illustrates the principle. Human and animal surveillance is essential to identify outbreak “sparks”, which are early cases that might cascade into a broader outbreak. Once an outbreak is underway, surveillance systems are critical to monitor disease transmission, identify hotspots and allocate public health resources. But surveillance systems do not function in isolation. They require effective primary health systems to screen and recognize potentially significant cases. They cannot work amidst violence and insecurity that impede movement and access to populations. And without financial resources to hire staff and fund field operations, they cannot be sustained.

Sectoral and institutional interdependencies are not just a feature of disease surveillance. Other vital elements of pandemic preparedness similarly rely on capacities and factors beyond the scope of the health system. During the 2014–15 West African Ebola crisis, outbreak response was constrained by weak infrastructure, which slowed and limited access to rural areas. Health communications aimed at changing behavioral

practices were rejected by some communities, particularly in areas with weak trust in the state.

These interdependencies receive limited consideration in existing assessment tools, including the GHSA and JEE, which instead focus detailed attention on the public health system and its legal and institutional framework. More holistic frameworks and metrics can help examine the underlying capacities that support—or constrain—national capacity to detect and mitigate public health threats.

Several efforts are underway to develop indexes that capture the preparedness status of countries. The Metabiota Preparedness Index, developed in 2015, measures national capacity to detect and respond to epidemic and pandemic outbreaks. The design of the index and selection of indicators was informed by a multidisciplinary team, with expertise in epidemiology, veterinary and clinical medicine, political economy, virology, behavioral health, and other disciplines. The resulting framework is multidimensional, consisting of five sub-indices measuring factors that influence a country's overall preparedness: public health infrastructure, physical and communications infrastructure, bureaucratic and public management capacities, financial resources to underwrite disease response, and risk communication. The sub-indices are weighted and combined into a composite score and rank, measuring the relative capacity of 188 countries.

The resulting distribution provides a picture of the geography of preparedness for epidemic and pandemic outbreaks. It identifies countries which are unprepared to mitigate and contain a public health threat, as well as regions with weak preparedness where outbreaks are more likely to sustain and spread across borders. The results of the index show that preparedness is relatively weaker in West and Central Africa and areas within Southeast Asia (Exhibit 6.1). Preparedness scores are highest among wealthy, industrialized countries in Western

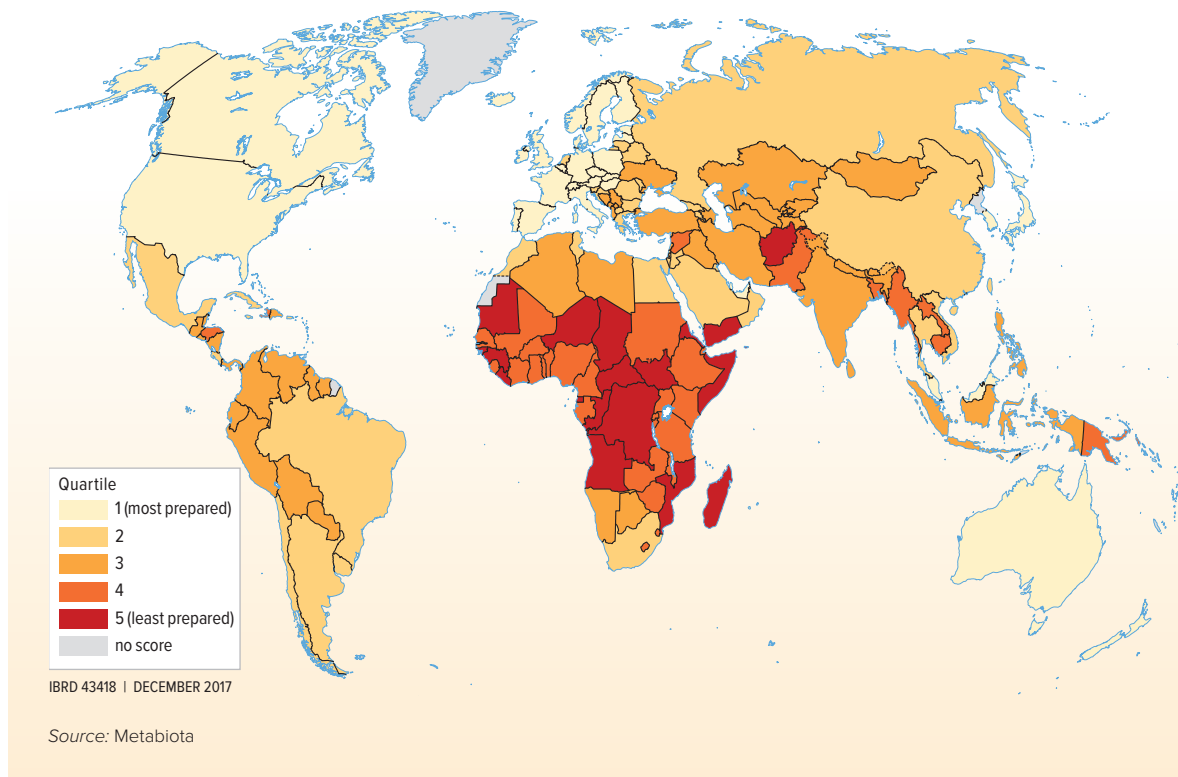
Europe and North America. However, analysis of the index results also find that GDP and other proxies for national wealth are imperfect predictors of preparedness, with many countries over-performing relative to national income.

The Infectious Disease Vulnerability Index, designed in 2016 by Rand Corporation, helps identify countries that are most vulnerable to disease outbreaks (Moore et al 2016). Developed initially as a tool for the U.S. government and international agencies, the index uses data from sources such as the World Bank, WHO and others to organize the factors that influence vulnerability into seven broad domains: demographic; health care; public health; disease dynamics; political-domestic; political-international, and; economic. The various indicators developed in each domain are weighted and summed into one composite index. The country scores so computed suggest that 22 out of the world's 25 most vulnerable countries are in the Africa region, the other three being Afghanistan, Yemen and Haiti. Somalia is ranked as the most vulnerable country in the world, followed by the Central African Republic, both of which play host to a dangerous combination of political instability and compromised health systems.

More recently, the Nuclear Threat Initiative (NTI), the Center for Health Security at the Johns Hopkins Bloomberg School of Public Health, and The Economist Intelligence Unit (EIU), are developing a Global Health Security (GHS) Index, which will assess a country's technical, financial, economic and political capabilities to prevent, detect, and rapidly respond to epidemic threats with international implications, whether naturally occurring, deliberate, or accidental. The GHS Index draws from internationally-accepted technical assessments, but also incorporates other important factors, such as countries' overall health system strength, commitment to global norms, socio-economic circumstances, and other risk environment factors. The GHS Index is intended to provide a public benchmarking of global health security conditions—building on

EXHIBIT 6.1 Global Distribution of Pandemic Preparedness

(1=most prepared, 5=least prepared)



the JEE, modelling many of the lessons learned from NTI's successful Nuclear Materials Security Index, and informed by an international expert advisory group. The GHS Index is also designed to promote dialogue around commitments, public-private partnerships to assist countries, and independent monitoring and oversight. The pilot phase of the GHS Index is expected to be completed in 2017.

Economic Vulnerability Arising from Industrial Structure of National Economies

When infectious disease outbreaks occur, they can affect economic activity through both labor shocks to industrial sectors and through reductions in consumption and trade. Outbreaks may affect certain industrial sectors more than others, for example those related to travel, tourism and

in the case of regional outbreaks, those that rely on globalized supply chains. Empirical study of the effects of previous outbreaks on consumption combined with structural modelling of national economies can provide insight into the likely range of industrial and trade effects that may result from an infectious disease accident. Whilst piecemeal analysis of previous outbreaks has been undertaken by academics, there is a lack of any systematic assessment to inform economic models of structural vulnerability. Developing such analyses is likely to be within the competencies of the World Bank, regional development banks, the IMF, and (where capacity exists), ministries of finance. Indeed, supporting ministries of finance to develop estimates of sectoral vulnerability, possibly augmented with simulation exercises that bring together assessments of intrinsic risk and prevention capacity, could be of great value. In doing this,

the World Bank, regional development banks and the IMF can help build both capacity and awareness of pandemic risk in finance ministries that may encourage countries to commit to fiscal measures that reduce their macroeconomic vulnerability to such risk.

IMF Article IV Staff Reports

IMF country surveillance under Article IV of the IMF's Articles of Agreement—often referred to as Article IV consultations—is an ongoing process that culminates in regular (usually annual) comprehensive consultations with individual member countries, with discussions in between as needed. During an Article IV consultation, an IMF team of economists visits a country to assess economic and financial developments and discuss the country's economic and financial policies with government and central bank officials. IMF staff missions also often meet with parliamentarians and representatives of business, labor unions, and civil society. The team reports its findings to IMF management and then presents them for discussion to the Executive Board, which represents all of the IMF's member countries. A summary of the Board's views is subsequently transmitted to the country's government. In this way, the views of the global community and the lessons of international experience are brought to bear on national policies.

We believe that Article IV consultations provide an excellent opportunity for the IMF to underscore the salience of the economic impact of pandemics, where such risks have a critical bearing on the macro-fiscal health of the economy.

The IMF, however, lacks the expertise to assess the risks of infectious disease outbreaks and thus assessments or indexes, as the one discussed previously in this chapter, will need to be taken by an official UN agency (or similar) for the IMF to include them in its Article IV consultations.

RECOMMENDATION 10: To reinforce incentives for national governments to invest in preparedness, the IMF and World Bank should work to facilitate the incorporation of the economic risks of infectious disease outbreaks into macroeconomic and market assessments, including: (i) inclusion into Article IV assessments where such risks are macro-critical; (ii) encouraging the development of academic and private sector indices and maps of intrinsic risk, preparedness and economic vulnerability.

Incorporating Assessment of Pandemic Preparedness in Country Policy and Institutional Assessments

Countries are likely to pay more attention to investing in preparedness if it increases access to concessional international finance. One way of doing so is by introducing an assessment of preparedness as a criterion in Country Policy and Institutional Assessment (CPIA), a tool that the World Bank uses to determine the allocation of IDA resources to countries (Box 6.2).

The CPIA is carried out over two phases to address fairness in country comparisons. First, a benchmarking phase is carried out to select a sample of countries representing each region which allows for normative adjustment in the rating scale. The intention is to allow for countries to progress with the indicator to a degree relative to their size or economy. The second stage uses the established benchmarks in combination with the 16 criteria to assess country profiles. Each year's ratings are independent of assessment in previous years, and focus on policies and performance over intentions and promises. Each criterion is rated separately on a scale of 1 (lowest) to 6 (highest), and to fully underscore the importance of the CPIA in the IDA Performance Based Allocations, the overall country score is referred to as the

BOX 6.2 The Performance-Based Allocation System for IDA18

The Country Performance Rating (CPR) of IDA countries is assessed annually using the Country Policy and Institutional Assessment (CPIA) ratings. The CPIA assesses each country's policy and institutional framework and consists of 16 criteria grouped into four equally weighted clusters: (i) economic management; (ii) structural policies; (iii) policies for social inclusion and equity; and (iv) public sector management and institutions. To ensure that the ratings are consistent with performance within and across regions: (i) detailed questions and definitions are provided to country teams for each of the rating levels for each of the 16 criteria; and (ii) a World Bank-wide process of rating and vetting a dozen "benchmark" countries is carried out to anchor the ratings in all IDA regions. This is followed by a process of institutional review of all country ratings before they are finalized.

CPIA Criteria

A. Economic Management

Monetary and Exchange Rate Policies; Fiscal Policy; Debt Policy and Management

B. Structural Policies

Trade; Financial Sector; Business Regulatory Environment

C. Policies for Social Inclusion

Gender Equality; Equity of Public Resource Use; Building Human Resources; Social Protection and Labor; Policies and Institutions for Environmental Sustainability

D. Public Sector Management and Institutions

Property Rights and Rule-based Governance; Quality of Budgetary and Financial Management; Efficiency of Revenue Mobilization; Quality of Public Administration; Transparency, Accountability and Corruption in the Public Sector

In addition to the CPIA, the IDA Portfolio Performance Rating (PPR), which captures the quality of management of IDA's projects and programs, enters the calculation of the CPR. The CPR in IDA18 will be calculated as:

$$\text{Country Performance Rating} = (0.24 \times \text{CPIAA-C} + 0.68 \times \text{CPIAD} + 0.08 \times \text{PPR})$$

where CPIAA-C is the average of the ratings of CPIA clusters A to C, and CPIAD is the rating of CPIA cluster D.

Country performance (with an exponent of 3 in the allocation formula) is the main determinant of IDA country allocations. Country needs are also considered through population size and GNI per capita. Population affects allocations positively (with an exponent of 1) while the level of GNI per capita is negatively related to allocations (with an exponent of -0.125).

Source: Draft of IDA18 Deputies' Report, October 2016. Accessed on June 3rd, 2017 at 18:00 hrs. URL: <https://ida.worldbank.org/sites/default/files/pdfs/ida18-draft-deputies-report.pdf>

IDA Resource Allocation Index (IRAI). A consultative process is also carried out before assessment with IDA-eligible countries.

Health does not have its own distinctive criteria, but is captured to various degrees in the other indicators. Gender equality assesses access to healthcare during delivery, family planning, and adolescent fertility rate as one-third of the component; equity of public resource use contains health as one of many listed public resources; building human resources allocates half the weight to health and includes the most detailed and explicit assessment of health outcomes, especially population and reproductive health, nutrition and prevention and treatment of communicable diseases such as HIV/AIDS, tuberculosis, and malaria.

For all IDA-eligible countries, the World Bank discloses: (i) the scores for the 16 criteria; (ii) the cluster averages; and (iii) the overall score (IRAI). The write-ups that provide the rationale for the ratings, and the sub-ratings that help determine the scores of some of the criteria are, however, not disclosed. The scores of IBRD countries are not disclosed and are used for Bank's internal purposes only.

Introducing an assessment of pandemic preparedness has two benefits. First, the fact that countries are being assessed—and the results disclosed—on pandemic preparedness will raise its visibility, profile and importance. Second, countries that do well on this assessment will be able to increase their allocations of concessional finance through IDA. The Country Performance Rating system directs more resources to countries that are performing better. During IDA15 (ending 2011), for instance, IDA countries in the top performance quintile received about 2.7 times in allocations per capita than those in the lowest quintile.

RECOMMENDATION 11: The World Bank should include assessment of pandemic preparedness capacity in the Country Policy and Institutional

Assessment (CPIA) tool and include the rating in the overall country score used as part of the IDA allocation formula. Other multilateral development banks should consider introducing equivalent mechanisms to incentivize investment in preparedness.

In 2013 the World Bank adopted a new World Bank Group Strategy focused on aligning all the institutions work with the twin goals of ending extreme poverty and boosting shared prosperity in a sustained manner. Shortly after, the Bank introduced Systematic Country Diagnostics (SCD), a diagnostic exercise to identify key challenges and opportunities for a country to accelerate progress towards development objectives that are consistent with the twin goals. This diagnostic is a reference point for client consultations on priorities for World Bank Group country engagement. As of June 30, 2014, the SCD is required prior to sending a Country Partnership Framework (CPF) to the World Bank Board for approval and acceptance. Given the CPF timeframe, the SCD focuses on identifying country development priorities for the next 4–6 years.

The SCD stimulates an open and forward-looking dialogue between the World Bank, client governments, the private sector, and the broader public. Not only does it identify priorities through which a country may most effectively and sustainably achieve the poverty reduction and shared prosperity goals, it also provides a valuable input into the policy debate and discourse within a country for the government's own development planning process. In this way, the SCD both uses and influences the development vision spelled out by the country authorities and stakeholders to support the dialogue on reducing extreme poverty and promoting shared prosperity in a sustainable manner at the country level.

The content of the SCD is context specific for the country; however, all discuss the challenges with respect to achieving the country's

development goals, identify the critical factors driving or constraining economic growth, identify the critical factors determining the inclusiveness of growth, analyze the environmental, social and fiscal sustainability of the current pattern of growth, distribution and poverty reduction, and identify and select a set of priorities or focus areas for a country, in order to maximize its progress toward achieving the twin goals. When completed, the SCD feeds into the CPF process, which eventually influences the areas for which the country can borrow or get grants from the World Bank.

Pandemics directly influence economic growth, poverty reduction, and longer-term sustainability of these trends. Not only does the impact of a pandemic represent a significant obstacle to the sustained reduction of poverty, a country's pandemic preparedness can have important future impacts on poverty. Incorporating an assessment of a country's pandemic preparedness in the World Bank's Systematic Country Diagnostics will emphasize its importance and give the issue greater visibility in the eyes of policy makers. Further, it will help countries make a strong case for concessional World Bank financing in support of investments in pandemic preparedness.

RECOMMENDATION 12: The World Bank should incorporate analysis of pandemic preparedness in country-specific Systematic Country Diagnostics that identify a set of priorities through which a country may most effectively and sustainably achieve the poverty reduction and shared prosperity goals.

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7

CONCLUSION: HEALTH SECURITY IN DOLLARS AND CENTS

We know that it is only a matter of time before the next pandemic hits us. We also know that there is a good chance that it will be severe. It may mean death on a slow fuse, spreading insidiously through populations, unrecognized for years, like HIV in the 1980s. Or it may strike people down with stark violence and lightning speed, plunging national economies abruptly into chaos, like Ebola in West Africa in 2014–15. Whatever its mode of attack, the next large-scale, lethal pandemic is at most only decades away.

Even if we escape the terrifying prospect of a lethal pandemic of global scope, the possibility that any of the outbreaks or epidemics that are occurring all the time might become such a pandemic can still cost many lives and cause huge disruption to economies and societies. The economic impact of infectious disease outbreaks is caused by the contagion of fear. And in our 24-hour media, highly interdependent world, fear spreads extraordinarily rapidly.

This time, though, the world can be better prepared, and communities and economies can be better protected. In the wake of Ebola and with the introduction of the JEE mechanism and other initiatives, countries and development partners are taking steps to improve their readiness to counter infectious disease outbreaks. There is much still to do, but given the technical and analytic tools that are being developed, the management frameworks, and the collaborative structures to facilitate regional cooperation we








are better placed than ever to make universal health security a reality.

The time to act is now, not only for national governments, but also for the international development partners. Exhibit 7.1 lists a series of actions that need to be taken by different stakeholders, which—collectively and severally—will make the world a safer place for everybody.

Of course, the money has to be there, too. Otherwise, unfortunately, none of the assessments and plans will matter. Between achieving real health security and aspirational rhetoric, the difference is dollars. This is the challenge the IWG has sought to address with this report. We are well aware that others have called for better funding of preparedness before with limited success. Yet we hope that three differences make this report more likely to have success: first, the recommendations are specific and time bound; second, they are practical and supported by tools; and third, the recommendations include mechanisms to change policy makers' incentives. Our report confirms the critical importance of pandemic preparedness for countries' economic future. It sets out a step-by-step plan for countries to secure the financing they will need. Our 12 recommendations define an integrated framework for action by countries and development partners, with clear timelines. If countries and the global community adopt the framework, we will see nations at all levels of income progress towards building universal health security.

EXHIBIT 7.1 Tackling Pandemic Preparedness—Roles and Responsibilities



All countries should:

-  Commit to strengthen universal health security
-  Assess their IHR core capacities and performance of veterinary services by conducting JEE and PVS by end 2019
-  Develop a prioritized and costed plan within 9 months of completion of gap assessment
-  Prepare a financing proposal within 3 months of completing a prioritized and costed plan
-  Engage and coordinate relevant stakeholders and develop a country-specific investment case
-  Examine ways of generating resources for preparedness from taxes
-  Regulate private sector investment in preparedness

International development partners should:

-  Commit to strengthen universal health security
-  Commit support to finance preparedness activities and catalyze domestic resource mobilization
-  Leverage insurance models to support response and recovery, including the PEF2
-  Facilitate incorporation of economic risk for infectious disease outbreaks into macroeconomic and market assessments

World Bank should:

-  Include preparedness indicators in the CPIA tool & IDA loan allocations
-  Include preparedness indicators in the country-specific systemic country diagnostics

In a highly mobile, densely interconnected, and warming world, there are reasons to believe that pandemic threats today are greater than ever. But so are our knowledge and capabilities for preparedness and response. Not “pie in the sky,” universal health security is now an achievable goal. However, goals come at a price. We must break the cycle of panic and neglect. The sums are not large relative to the risks. The returns on investment are extraordinarily high. We must secure commitments to sustained financing and

monitor that these are delivered. Otherwise we will continue to see the most vulnerable countries being afflicted by outbreaks that cause terrible loss of life and knock them off their development trajectories. Otherwise we put the world at risk of some highly contagious deadly influenza or other virus that could kill millions and wipe trillions from the global economy. We all have a stake in global security. Investing in national preparedness is the most cost-effective way to protect us all.

APPENDIX A—GUIDANCE FOR PLANNING

Following the momentum gained on the JEE assessments in the countries, the WHO has started to work with countries on the creation of National Action Plans (NAPHS). A guidance for the completion of NAPHS has been issued (WHO 2017) and is being refined as the planning exercises continue in more countries.

This section and the documents linked to it pursue the following objectives:

1. Outline some basic guiding principles for the creation of NAPHS that have been compiled through interviews with several global and regional entities and representatives of the countries
2. Give the countries an example of a planning template and actions suggested to fill gaps identified in the JEE

Guiding Principles to Ensure Successful Financing and Execution of the NAPHS

- Integrate the plan in existing processes, instead of making it a standalone plan
 - The national action plan for health security (NAPHS) should include and coordinate relevant existing national plans related to emergencies, such as pandemic preparedness plans, PIP national plans, plans for national disasters, and IHR national plans
 - Planned activities should be integrated into countries' existing planning and budgeting processes (e.g., national health plan, security plan, human resources development, etc.)
 - Action against antimicrobial resistance is part of the NAPHS and as such synergies between both plans should be highlighted
- Base the plan on best practices and guidelines, but tailor it to the specific country needs
 - Activities outlined in the NAPHS should aim at filling the main gaps identified in the diagnostic (including the JEE and PVS assessments), but prioritization should be given to the gaps that represent the biggest vulnerabilities for the country (e.g., there may be a gap in capacities related to radiation risk, but also no radiation sources in the country). Additionally, not all missing capacities necessarily need to be built in the country; in some cases, especially for smaller countries with limited resources, the action could be granting access to capacities present at the regional level or in a partnering country

- The NAPHS should draw from existing supporting tools (e.g., planning template, costing tools), but it needs to be tailored to the country's specific needs, peculiarities and costs
 - Best practices should be shared across countries; this could mean including representatives from countries that already went through the planning process (e.g. Tanzania, Pakistan, Eritrea) in the planning process or partnering countries with similar characteristics
- Create the plan with the right stakeholder
 - Countries are the owners of the NAPHS and all relevant stakeholders/key decision makers from the country leadership should be involved in the planning process (e.g., Ministries of health, agriculture, defense, finance, prime minister office, etc.)
 - The Ministry of Finance should be involved from the beginning, in order to facilitate integration in the budgeting and planning processes and for cross-sectoral coordination
 - A few main donors could take part to the planning process in order to clarify high level commitments and coordinate efforts (e.g. avoid duplication of efforts on certain technical areas and gaps in others)
 - Ensure sufficient detail in costing to enable subsequent domestic budgeting and donor engagement

Example of Planning Template

The template provided in this footnote¹⁵ gives an example of a country planning tool, with suggested actions to fill gaps in each technical area. It has been built based on existing planning guidelines and other examples of tools and strategies. These include the WHO Country Planning Guide and Matrix, WHO Country Planning checklist, CDC Milestones Library, and other relevant global publications. Regional strategies were also considered in the development of the country planning template.

This template is designed to also facilitate countries prioritization of their planned activities and link these to costing, thus enhancing country ownership, leadership and accountability.

The WHO will continue to review and enhance the template for further alignment with other key critical indicators and areas such as health systems. After piloting, WHO should share the final tool with Member States and partners to support the development of NAPHS.

¹⁵ Link to the planning template: <http://pubdocs.worldbank.org/en/778091506013556087/example-planning-template-IWG-Report-xlsx.xlsx>

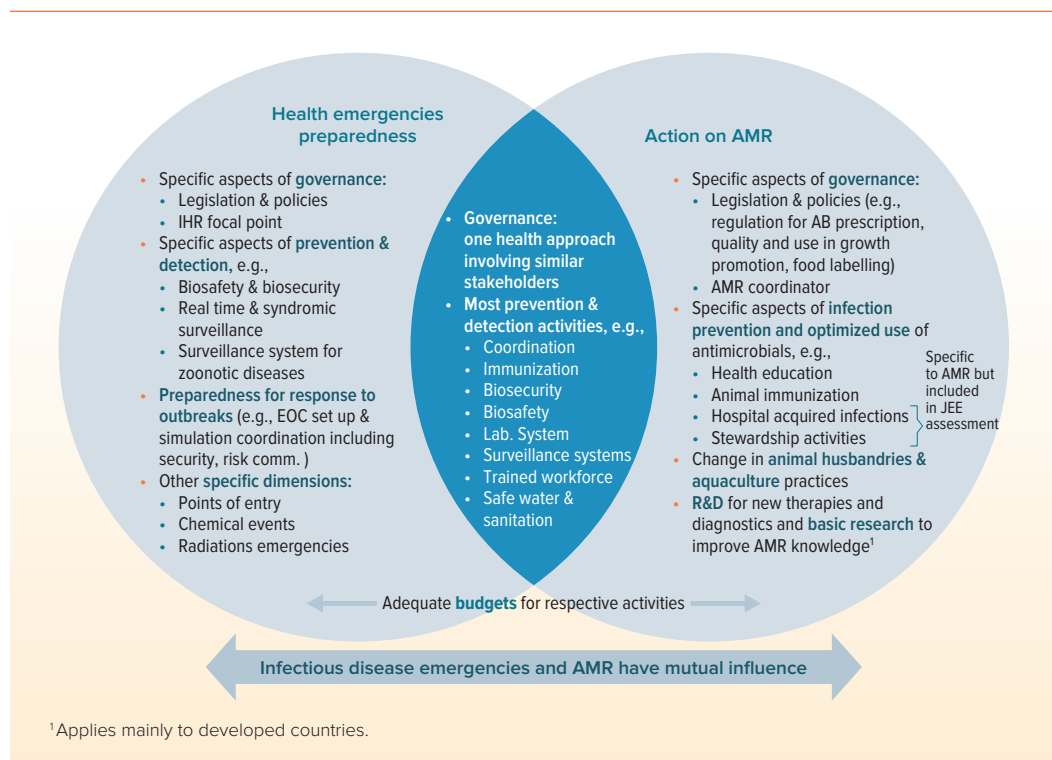
APPENDIX B—INTEGRATION/OVERLAP OF ACTION ON ANTIMICROBIAL RESISTANCE AND HEALTH EMERGENCIES PREPAREDNESS

Action on Antimicrobial Resistance (AMR) and Health Emergencies Preparedness

Infectious disease emergencies and AMR have mutual influence: infectious diseases preparedness decreases the incidence of infections and therefore pressure for AMR, while decrease of antimicrobial resistance decreases the risk of infectious outbreaks and provides better chances to contain upcoming outbreaks.

Some of the activities described in the JEE and national health plans for health security and in the AMR national action plans are therefore partly overlapping and synergistic. These include most prevention and detection activities. Both health emergencies preparedness and AMR also require specific activities and capacities (Exhibit B.1).

EXHIBIT B.1 Some Dimensions of Health Emergencies Preparedness and Action on AMR are Overlapping at Country Level



APPENDIX C—REGIONAL LOSS ESTIMATES OF INFECTIOUS DISEASE OUTBREAKS AND AMR

Estimates of the projected economic impact of infectious disease crises have helped make the case for global action. Although such estimates have been helpful in focusing the attention of the international community on pandemic risk, the tendency to present figures at a global scale limits the ability of national and regional stakeholders to appreciate the implications of these risks for their local contexts. To support the development of the case for investment at the regional and national level we have prepared preliminary estimates of the expected annual economic loss associated with pandemic disease over the next century.¹⁶

Estimation Method

We use estimates previously calculated by Fan, Jamison and Summers (2015) of the expected economic losses arising from pandemic influenza as the basis for our estimates. The primary advantage of using these estimates (as compared to others in the literature) is that they include both the direct and mortality-inclusive costs of pandemic outbreaks and thus better capture the totality of economic damage arising from pandemics. Additionally, Fan, Jamison and Summers (2015) not only report estimates of annualized impact of pandemic influenza at the global level (using 2015 economic and demographic data), but also disaggregate the expected impact by World Bank income group (i.e., low, lower middle, upper middle and high income countries).

This disaggregation allows us to estimate country-level losses by assigning these losses to countries in proportion to their share of total GDP within a given income grouping;¹⁷ so for example, a low-income country that accounted for 5 percent of the total GDP for low income countries in 2015 would be allocated 5 percent of the expected economic losses. These country level estimates are then aggregated to regional estimates by summing the expected economic losses of all countries making up a defined geographic region.

Although we report only point estimates for pandemic economic losses at each level of estimation, it is important to acknowledge the considerable uncertainty inherent in any

¹⁶ Expected loss is the average annual economic losses arising from pandemics over an extended period. For example, if estimates suggest that we would typically expect to see 3 pandemics in the next 100 years that between them would cause \$60 trillion of economic damage, we would calculate the expected economic loss by dividing the total loss figure by 100 to give us an expected annual loss of \$600 billion.

¹⁷ All GDP and population data are derived from the World Bank data bank, accessed on June 5th, 2017 at 10:00 hrs. URLs: <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD> for GDP and <http://data.worldbank.org/indicator/SP.POPTOTL> for population. Countries with less than 100,000 population or with 4+ missing years of GDP data are excluded from the following analyses.

estimation approach. Fan and colleagues attempt to reflect uncertainty around their estimates by applying an estimation range of ± 40 percent around each point estimate. These estimate ranges do not correspond to estimation intervals as might be classically derived using statistical or econometric methods, but rather represent the authors' attempts to communicate a reasonable level of uncertainty around their estimates. We do not reproduce these ranges around the country-level estimates presented here, but we would similarly counsel keeping this fundamental uncertainty in mind.

Advantages and Limitations of Estimation Method

Although our “top down” approach of interpolating from global estimates is necessarily rough in its approach, it does have the benefit of producing rapid estimates for the vast number of countries where more detailed ‘bottom up’ estimates are not available. The drawback of such an approach however is that it will miss much of the local context that might affect country-level estimates of the economic damage caused by infectious disease outbreaks. As such our figures should not be taken as definitive but in the absence of more detailed local assessments might be considered a reasonable base case.

Wherever possible we encourage the development of detailed national and regional estimates that take into account relevant local factors in their estimation models, as discussed in the section 6 of the main report. The estimates below are intended to provide a rough sense of the scale of the threat posed by pandemic outbreaks at the regional and national levels and should be thought of as starting points for framing the economic case for investing in preparedness. They are neither intended to be definitive nor should they be used as the basis of comparative risk assessment between countries for the purposes of directing investment or lending.

Another important limitation of our approach is that it is based solely on estimates of economic losses expected to arise as a result of pandemic influenza. As such it does not capture the expected economic impact of other pathogens that have previously caused significant economic damage, such as SARS, MERS, Ebola and Zika. It also does not capture the effect of outbreaks that occur at a smaller scale than full blown pandemics or of the effects of emerging diseases becoming endemic (as happened with HIV). For these reasons, the estimates might be viewed as conservative in their relationship to the true economic costs of infectious disease crises. Clarifying this will be of particular importance when presenting these figures as part of any efforts to develop an economic case for investing in pandemic preparedness.

Results

We calculate expected economic loss for six distinct geographic regions shown in Exhibit C1 and present these regional estimates in Table C1. We also report national level estimates of expected economic loss in Exhibit C2 and Table C2.

Conclusion

Recent estimates of the potentially extreme economic impacts of infectious disease crises have undoubtedly bolstered the case for greater investments in preparedness. However, the consistent focus of these reports on global-level costs may leave policy-makers within national governments without a clear sense of regional or country-specific impacts. Given that these actors ultimately bear the responsibility for addressing these risks, it is important to provide them with the most individually tailored information possible. The work described here should be treated as only a first step in this process, primarily highlighting a need for higher-resolution estimates on the impact of infectious disease crises, rather than settling the issue.

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EXHIBIT C1 Geographic Regions Used in Developing Regional Estimates of Pandemic Losses

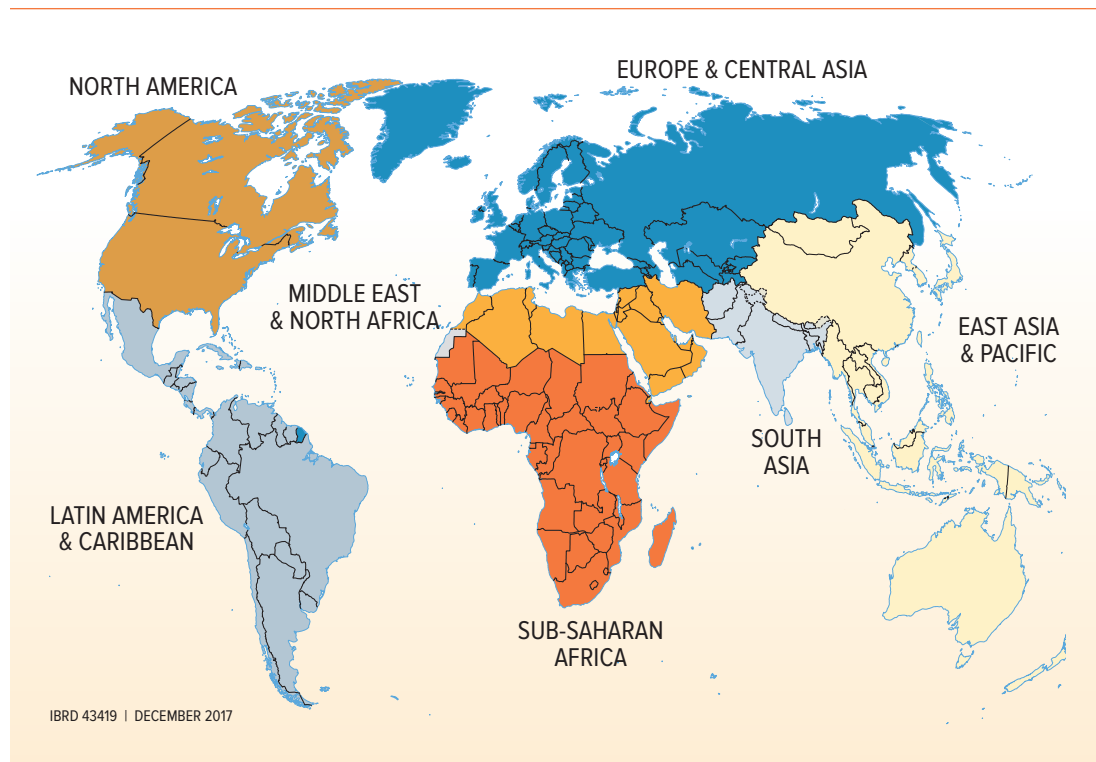


TABLE C.1 Estimated Regional Vulnerability to Economic Losses from Pandemics

Region	Population (billions)	2015 GDP (US\$ trillion)	Expected annual pandemic loss (US\$ billion)	Expected annual pandemic loss (% GDP)
East Asia & Pacific	2.23	21.2	196.9	0.9
Europe & Central Asia	0.89	20.1	110.3	0.5
Latin America & Caribbean	0.63	5.4	59.4	1.1
Middle East & North Africa	0.46	3.1	27.8	0.9
North America	0.36	19.6	86.5	0.4
South Asia	1.74	2.7	53.3	2.0
Sub-Saharan Africa	1.02	1.6	27.9	1.7

EXHIBIT C2 Expected Annual Losses Arising from Pandemics as a Share of National GDP

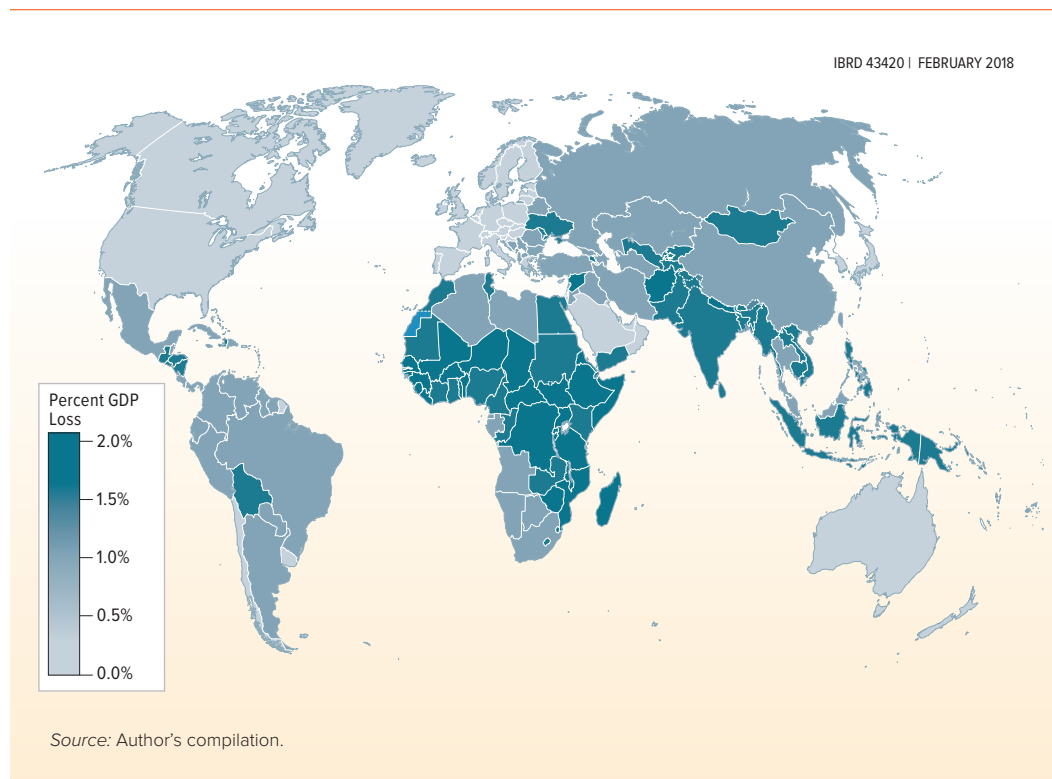


TABLE C.2 Estimated Country Level Vulnerability to Economic Losses from Pandemics

Country	Region	Income group	2015 Population	2015 GDP (\$)	Expected annual pandemic loss (\$)	Expected annual pandemic loss per capita (\$)	Expected annual pandemic loss (% GNI)
Afghanistan	South Asia	Low income	32,526,562	\$19,331,286,549	\$399,244,953	\$12.27	2.06
Albania	Europe & Central Asia	Upper middle income	2,889,167	\$11,398,392,444	\$128,538,789	\$44.49	1.13
Algeria	Middle East & North Africa	Upper middle income	39,666,519	\$165,000,000,000	\$1,858,200,019	\$46.85	1.13
Angola	Sub-Saharan Africa	Upper middle income	25,021,974	\$103,000,000,000	\$1,157,316,729	\$46.25	1.12
Argentina	Latin America & Caribbean	Upper middle income	43,416,755	\$585,000,000,000	\$6,593,740,655	\$151.87	1.13
Armenia	Europe & Central Asia	Lower middle income	3,017,712	\$10,529,182,498	\$209,002,797	\$69.26	1.99
Aruba	Latin America & Caribbean	High income	103,889	\$2,584,463,687	\$11,412,415	\$109.85	0.44
Australia	East Asia & Pacific	High income	23,781,169	\$1,340,000,000,000	\$5,913,343,604	\$248.66	0.44
Austria	Europe & Central Asia	High income	8,611,088	\$377,000,000,000	\$1,664,527,138	\$193.30	0.44
Azerbaijan	Europe & Central Asia	Upper middle income	9,651,349	\$53,047,140,347	\$598,208,493	\$61.98	1.13
Bahamas, The	Latin America & Caribbean	High income	388,019	\$8,853,519,100	\$39,095,166	\$100.76	0.44
Bahrain	Middle East & North Africa	High income	1,377,237	\$31,125,851,064	\$137,444,817	\$99.80	0.44
Bangladesh	South Asia	Lower middle income	160,995,642	\$195,000,000,000	\$3,872,290,808	\$24.05	1.99
Barbados	Latin America & Caribbean	High income	284,215	\$4,385,250,000	\$19,364,286	\$68.13	0.44
Belarus	Europe & Central Asia	Upper middle income	9,513,000	\$54,608,962,635	\$615,821,042	\$64.73	1.13
Belgium	Europe & Central Asia	High income	11,285,721	\$455,000,000,000	\$2,009,558,289	\$178.06	0.44
Belize	Latin America & Caribbean	Upper middle income	359,287	\$1,752,861,128	\$19,766,879	\$55.02	1.13
Benin	Sub-Saharan Africa	Low income	10,879,829	\$8,290,986,804	\$171,231,989	\$15.74	2.07
Bhutan	South Asia	Lower middle income	774,830	\$2,057,947,621	\$40,849,972	\$52.72	1.98
Bolivia	Latin America & Caribbean	Lower middle income	10,724,705	\$32,997,684,515	\$654,999,413	\$61.07	1.98
Bosnia and Herzegovina	Europe & Central Asia	Upper middle income	3,810,416	\$16,191,716,215	\$182,592,730	\$47.92	1.13
Botswana	Sub-Saharan Africa	Upper middle income	2,262,485	\$14,389,717,321	\$162,271,728	\$71.72	1.13
Brazil	Latin America & Caribbean	Upper middle income	207,847,528	\$1,800,000,000,000	\$20,339,621,339	\$97.86	1.13
Brunei Darussalam	East Asia & Pacific	High income	423,188	\$12,930,394,938	\$57,097,740	\$134.92	0.44
Bulgaria	Europe & Central Asia	Upper middle income	7,177,991	\$50,199,117,547	\$566,091,560	\$78.86	1.13
Burkina Faso	Sub-Saharan Africa	Low income	18,105,570	\$10,678,201,939	\$220,534,636	\$12.18	2.07
Burundi	Sub-Saharan Africa	Low income	11,178,921	\$3,097,324,740	\$63,968,390	\$5.72	2.06
Cabo Verde	Sub-Saharan Africa	Lower middle income	520,502	\$1,603,239,233	\$31,824,074	\$61.14	1.98
Cambodia	East Asia & Pacific	Lower middle income	15,577,899	\$18,049,954,289	\$358,289,063	\$23.00	1.99

Country	Region	Income group	2015 Population	2015 GDP (\$)	Expected annual pandemic loss (\$)	Expected annual pandemic loss per capita (\$)	Expected annual pandemic loss (% GNI)
Cameroon	Sub-Saharan Africa	Lower middle income	23,344,179	\$28,415,950,981	\$564,052,644	\$24.16	1.98
Canada	North America	High income	35,851,774	\$1,550,000,000,000	\$6,856,862,675	\$191.26	0.44
Central African Republic	Sub-Saharan Africa	Low income	4,900,274	\$1,583,776,760	\$32,709,405	\$6.68	2.07
Chad	Sub-Saharan Africa	Low income	14,037,472	\$10,888,798,114	\$224,884,034	\$16.02	2.07
Chile	Latin America & Caribbean	High income	17,948,141	\$241,000,000,000	\$1,063,301,437	\$59.24	0.44
China	East Asia & Pacific	Upper middle income	1,371,220,000	\$11,100,000,000,000	\$124,775,764,825	\$91.00	1.12
Colombia	Latin America & Caribbean	Upper middle income	48,228,704	\$292,000,000,000	\$3,293,763,535	\$68.29	1.13
Comoros	Sub-Saharan Africa	Low income	788,474	\$565,689,764	\$11,683,070	\$14.82	2.07
Congo, Dem. Rep.	Sub-Saharan Africa	Low income	77,266,814	\$35,237,742,278	\$727,757,604	\$9.42	2.07
Congo, Rep.	Sub-Saharan Africa	Lower middle income	4,620,330	\$8,553,154,506	\$169,778,918	\$36.75	1.99
Costa Rica	Latin America & Caribbean	Upper middle income	4,807,850	\$54,136,834,091	\$610,496,885	\$126.98	1.13
Côte d'Ivoire	Sub-Saharan Africa	Lower middle income	22,701,556	\$31,759,248,868	\$630,416,639	\$27.77	1.99
Croatia	Europe & Central Asia	High income	4,224,404	\$48,732,003,674	\$215,189,661	\$50.94	0.44
Cuba	Latin America & Caribbean	Upper middle income	11,389,562	\$87,132,800,000	\$982,589,836	\$86.27	1.13
Cyprus	Europe & Central Asia	High income	1,165,300	\$19,559,942,331	\$86,372,343	\$74.12	0.44
Czech Republic	Europe & Central Asia	High income	10,551,219	\$185,000,000,000	\$817,607,605	\$77.49	0.44
Denmark	Europe & Central Asia	High income	5,676,002	\$301,000,000,000	\$1,330,508,935	\$234.41	0.44
Djibouti	Middle East & North Africa	Lower middle income	887,861	\$1,727,000,000	\$34,280,708	\$38.61	1.98
Dominican Republic	Latin America & Caribbean	Upper middle income	10,528,391	\$68,102,618,092	\$767,987,949	\$72.94	1.13
Ecuador	Latin America & Caribbean	Upper middle income	16,144,363	\$100,000,000,000	\$1,129,688,269	\$69.97	1.13
Egypt, Arab Rep.	Middle East & North Africa	Lower middle income	91,508,084	\$331,000,000,000	\$6,565,916,788	\$71.75	1.98
El Salvador	Latin America & Caribbean	Lower middle income	6,126,583	\$25,850,200,000	\$513,122,847	\$83.75	1.98
Equatorial Guinea	Sub-Saharan Africa	Upper middle income	845,060	\$12,202,323,684	\$137,604,659	\$162.83	1.13
Eritrea	Sub-Saharan Africa	Low income	4,789,568	\$2,607,739,837	\$53,857,097	\$11.24	2.06
Estonia	Europe & Central Asia	High income	1,311,998	\$22,459,443,274	\$99,175,893	\$75.59	0.44
Ethiopia	Sub-Saharan Africa	Low income	99,390,750	\$61,539,711,687	\$1,270,966,589	\$12.79	2.07
Fiji	East Asia & Pacific	Upper middle income	892,145	\$4,425,503,075	\$49,906,055	\$55.94	1.13
Finland	Europe & Central Asia	High income	5,482,013	\$232,000,000,000	\$1,026,010,200	\$187.16	0.44
France	Europe & Central Asia	High income	66,808,385	\$2,420,000,000,000	\$10,681,058,025	\$159.88	0.44
Gabon	Sub-Saharan Africa	Upper middle income	1,725,292	\$14,262,032,471	\$160,831,835	\$93.22	1.13
Gambia, The	Sub-Saharan Africa	Low income	1,990,924	\$938,794,719	\$19,388,728	\$9.74	2.07
Georgia	Europe & Central Asia	Upper middle income	3,679,000	\$13,965,385,802	\$157,486,574	\$42.81	1.13
Germany	Europe & Central Asia	High income	81,413,145	\$3,360,000,000,000	\$14,852,245,132	\$182.43	0.44

Country	Region	Income group	2015 Population	2015 GDP (\$)	Expected annual pandemic loss (\$)	Expected annual pandemic loss per capita (\$)	Expected annual pandemic loss (% GNI)
Ghana	Sub-Saharan Africa	Lower middle income	27,409,893	\$37,543,361,204	\$745,230,458	\$2719	1.99
Greece	Europe & Central Asia	High income	10,823,732	\$195,000,000,000	\$860,418,563	\$79.49	0.44
Grenada	Latin America & Caribbean	Upper middle income	106,825	\$984,074,074	\$11,097,327	\$103.88	1.13
Guam	East Asia & Pacific	High income	169,885	\$5,734,000,000	\$25,320,065	\$149.04	0.44
Guatemala	Latin America & Caribbean	Lower middle income	16,342,897	\$63,794,152,886	\$1,266,304,993	\$77.48	1.98
Guinea	Sub-Saharan Africa	Low income	12,608,590	\$6,699,203,543	\$138,357,227	\$10.97	2.06
Guinea-Bissau	Sub-Saharan Africa	Low income	1,844,325	\$1,056,776,883	\$21,825,388	\$11.83	2.06
Guyana	Latin America & Caribbean	Upper middle income	767,085	\$3,166,029,056	\$35,703,064	\$46.54	1.13
Haiti	Latin America & Caribbean	Low income	10,711,067	\$8,765,329,890	\$181,028,496	\$16.90	2.07
Honduras	Latin America & Caribbean	Lower middle income	8,075,060	\$20,420,967,149	\$405,353,336	\$50.20	1.99
Hong Kong SAR, China	East Asia & Pacific	High income	7,305,700	\$309,000,000,000	\$1,365,512,799	\$186.91	0.44
Hungary	Europe & Central Asia	High income	9,844,686	\$122,000,000,000	\$537,466,297	\$54.59	0.44
Iceland	Europe & Central Asia	High income	330,823	\$16,779,598,787	\$74,094,966	\$223.97	0.44
India	South Asia	Lower middle income	1,311,050,527	\$2,090,000,000,000	\$41,463,181,226	\$31.63	1.98
Indonesia	East Asia & Pacific	Lower middle income	257,563,815	\$862,000,000,000	\$17,109,269,091	\$66.43	1.98
Iran, Islamic Rep.	Middle East & North Africa	Upper middle income	79,109,272	\$425,000,000,000	\$4,796,368,356	\$60.63	1.13
Iraq	Middle East & North Africa	Upper middle income	36,423,395	\$180,000,000,000	\$2,030,624,165	\$55.75	1.13
Ireland	Europe & Central Asia	High income	4,640,703	\$284,000,000,000	\$1,252,769,181	\$269.95	0.44
Israel	Middle East & North Africa	High income	8,380,400	\$299,000,000,000	\$1,322,154,285	\$157.77	0.44
Italy	Europe & Central Asia	High income	60,802,085	\$1,820,000,000,000	\$8,043,337,795	\$132.29	0.44
Jamaica	Latin America & Caribbean	Upper middle income	2,725,941	\$14,262,190,323	\$160,833,616	\$59.00	1.13
Japan	East Asia & Pacific	High income	126,958,472	\$4,380,000,000,000	\$19,354,703,829	\$152.45	0.44
Jordan	Middle East & North Africa	Upper middle income	7,594,547	\$37,517,410,282	\$423,080,930	\$55.71	1.13
Kazakhstan	Europe & Central Asia	Upper middle income	17,544,126	\$184,000,000,000	\$2,079,329,193	\$118.52	1.13
Kenya	Sub-Saharan Africa	Lower middle income	46,050,302	\$63,398,041,540	\$1,258,442,239	\$27.33	1.99
Kiribati	East Asia & Pacific	Lower middle income	112,423	\$160,121,929	\$3,178,398	\$28.27	1.98
Korea, Rep.	East Asia & Pacific	High income	50,617,045	\$1,380,000,000,000	\$6,084,366,647	\$120.20	0.44
Kuwait	Middle East & North Africa	High income	3,892,115	\$114,000,000,000	\$503,579,624	\$129.38	0.44
Kyrgyz Republic	Europe & Central Asia	Lower middle income	5,957,000	\$6,571,853,849	\$130,450,378	\$21.90	1.99
Lao PDR	East Asia & Pacific	Lower middle income	6,802,023	\$12,369,080,043	\$245,524,505	\$36.10	1.99
Latvia	Europe & Central Asia	High income	1,978,440	\$27,002,832,428	\$119,238,486	\$60.27	0.44
Lebanon	Middle East & North Africa	Upper middle income	5,850,743	\$47,084,703,151	\$530,970,550	\$90.75	1.13
Lesotho	Sub-Saharan Africa	Lower middle income	2,135,022	\$2,278,037,786	\$45,218,731	\$21.18	1.99
Liberia	Sub-Saharan Africa	Low income	4,503,438	\$2,053,000,000	\$42,400,173	\$9.42	2.07

Country	Region	Income group	2015 Population	2015 GDP (\$)	Expected annual pandemic loss (\$)	Expected annual pandemic loss per capita (\$)	Expected annual pandemic loss (% GNI)
Libya	Middle East & North Africa	Upper middle income	6,278,438	\$34,699,395,524	\$391,302,396	\$62.32	1.13
Lithuania	Europe & Central Asia	High income	2,910,199	\$41,400,137,851	\$182,813,776	\$62.82	0.44
Luxembourg	Europe & Central Asia	High income	569,676	\$56,799,626,262	\$250,814,483	\$440.28	0.44
Macao SAR, China	East Asia & Pacific	High income	587,606	\$46,177,532,874	\$203,909,687	\$347.02	0.44
Macedonia, FYR	Europe & Central Asia	Upper middle income	2,078,453	\$10,086,021,261	\$113,739,280	\$54.72	1.13
Madagascar	Sub-Saharan Africa	Low income	24,235,390	\$9,738,652,322	\$201,130,317	\$8.30	2.07
Malawi	Sub-Saharan Africa	Low income	17,215,232	\$6,403,820,949	\$132,256,753	\$7.68	2.06
Malaysia	East Asia & Pacific	Upper middle income	30,331,007	\$296,000,000,000	\$3,341,160,441	\$110.16	1.13
Maldives	South Asia	Upper middle income	409,163	\$3,435,244,659	\$38,738,988	\$94.68	1.13
Mali	Sub-Saharan Africa	Low income	17,599,694	\$12,746,688,962	\$263,254,659	\$14.96	2.07
Malta	Middle East & North Africa	High income	431,333	\$9,746,478,873	\$43,038,277	\$99.78	0.44
Mauritania	Sub-Saharan Africa	Lower middle income	4,067,564	\$5,442,297,174	\$108,028,836	\$26.56	1.99
Mauritius	Sub-Saharan Africa	Upper middle income	1,262,605	\$11,681,761,261	\$131,734,317	\$104.34	1.13
Mexico	Latin America & Caribbean	Upper middle income	127,017,224	\$1,140,000,000,000	\$12,898,431,232	\$101.55	1.13
Micronesia, Fed. Sts.	East Asia & Pacific	Lower middle income	104,460	\$314,971,100	\$6,252,132	\$59.85	1.98
Moldova	Europe & Central Asia	Lower middle income	3,554,150	\$6,568,288,862	\$130,379,613	\$36.68	1.98
Mongolia	East Asia & Pacific	Lower middle income	2,959,134	\$11,741,338,841	\$233,063,930	\$78.76	1.98
Montenegro	Europe & Central Asia	Upper middle income	622,388	\$3,987,061,628	\$44,961,785	\$72.24	1.13
Morocco	Middle East & North Africa	Lower middle income	34,377,511	\$101,000,000,000	\$1,996,756,951	\$58.08	1.98
Mozambique	Sub-Saharan Africa	Low income	27,977,863	\$14,807,075,727	\$305,807,389	\$10.93	2.07
Myanmar	East Asia & Pacific	Lower middle income	53,897,154	\$62,600,906,116	\$1,242,619,212	\$23.06	1.99
Namibia	Sub-Saharan Africa	Upper middle income	2,458,830	\$11,491,507,356	\$129,588,838	\$52.70	1.13
Nepal	South Asia	Low income	28,513,700	\$21,194,888,048	\$437,733,519	\$15.35	2.07
Netherlands	Europe & Central Asia	High income	16,936,520	\$750,000,000,000	\$3,313,086,827	\$195.62	0.44
New Zealand	East Asia & Pacific	High income	4,595,700	\$174,000,000,000	\$767,258,916	\$166.95	0.44
Nicaragua	Latin America & Caribbean	Lower middle income	6,082,032	\$12,692,562,187	\$251,945,580	\$41.42	1.98
Niger	Sub-Saharan Africa	Low income	19,899,120	\$7,142,951,342	\$147,521,856	\$7.41	2.06
Nigeria	Sub-Saharan Africa	Lower middle income	182,201,962	\$487,000,000,000	\$9,662,772,821	\$53.03	1.98
Norway	Europe & Central Asia	High income	5,195,921	\$387,000,000,000	\$1,707,042,239	\$328.54	0.44
Oman	Middle East & North Africa	High income	4,490,541	\$69,830,949,285	\$308,357,899	\$68.67	0.44
Pakistan	South Asia	Lower middle income	188,924,874	\$271,000,000,000	\$5,380,304,509	\$28.48	1.99
Panama	Latin America & Caribbean	Upper middle income	3,929,141	\$52,132,289,747	\$587,891,793	\$149.62	1.13
Papua New Guinea	East Asia & Pacific	Lower middle income	7,619,321	\$16,928,680,397	\$336,031,933	\$44.10	1.98

Country	Region	Income group	2015 Population	2015 GDP (\$)	Expected annual pandemic loss (\$)	Expected annual pandemic loss per capita (\$)	Expected annual pandemic loss (% GNI)
Paraguay	Latin America & Caribbean	Upper middle income	6,639,123	\$27,093,938,619	\$305,536,247	\$46.02	1.13
Peru	Latin America & Caribbean	Upper middle income	31,376,670	\$189,000,000,000	\$2,132,590,098	\$67.97	1.13
Philippines	East Asia & Pacific	Lower middle income	100,699,395	\$292,000,000,000	\$5,805,111,360	\$57.65	1.99
Poland	Europe & Central Asia	High income	37,999,494	\$477,000,000,000	\$2,106,617,068	\$55.44	0.44
Portugal	Europe & Central Asia	High income	10,348,648	\$199,000,000,000	\$879,238,605	\$84.96	0.44
Puerto Rico	Latin America & Caribbean	High income	3,474,182	\$103,000,000,000	\$455,421,160	\$131.09	0.44
Qatar	Middle East & North Africa	High income	2,235,355	\$165,000,000,000	\$727,017,940	\$325.24	0.44
Romania	Europe & Central Asia	Upper middle income	2,235,355	\$178,000,000,000	\$2,006,773,474	\$897.74	1.13
Russian Federation	Europe & Central Asia	Upper middle income	144,096,812	\$1,370,000,000,000	\$15,402,810,189	\$106.89	1.12
Rwanda	Sub-Saharan Africa	Low income	11,609,666	\$8,095,980,014	\$167,204,555	\$14.40	2.06
Samoa	East Asia & Pacific	Lower middle income	193,228	\$761,037,916	\$15,106,496	\$78.18	1.98
São Tomé and Príncipe	Sub-Saharan Africa	Lower middle income	190,344	\$317,696,179	\$6,306,225	\$33.13	1.98
Saudi Arabia	Middle East & North Africa	High income	31,540,372	\$646,000,000,000	\$2,852,600,770	\$90.44	0.44
Senegal	Sub-Saharan Africa	Low income	15,129,273	\$13,609,989,582	\$281,084,223	\$18.58	2.07
Serbia	Europe & Central Asia	Upper middle income	7,098,247	\$37,160,332,465	\$419,054,191	\$59.04	1.13
Sierra Leone	Sub-Saharan Africa	Low income	6,453,184	\$4,214,779,785	\$87,046,951	\$13.49	2.07
Singapore	East Asia & Pacific	High income	5,535,002	\$293,000,000,000	\$1,292,670,142	\$233.54	0.44
Slovak Republic	Europe & Central Asia	High income	5,424,050	\$87,263,622,047	\$385,336,695	\$71.04	0.44
Slovenia	Europe & Central Asia	High income	2,063,768	\$42,774,769,768	\$188,883,844	\$91.52	0.44
Solomon Islands	East Asia & Pacific	Lower middle income	583,591	\$1,129,164,719	\$22,413,761	\$38.41	1.99
Somalia	Sub-Saharan Africa	Low income	10,787,104	\$5,925,000,000	\$122,367,766	\$11.34	2.06
South Africa	Sub-Saharan Africa	Upper middle income	77,266,814	\$315,000,000,000	\$3,547,404,077	\$45.91	1.13
South Sudan	Sub-Saharan Africa	Low income	12,339,812	\$9,015,221,096	\$186,189,446	\$15.09	2.07
Spain	Europe & Central Asia	High income	46,418,269	\$1,190,000,000,000	\$5,267,580,377	\$113.48	0.44
Sri Lanka	South Asia	Lower middle income	20,966,000	\$82,316,172,384	\$1,633,964,484	\$77.93	1.98
St. Lucia	Latin America & Caribbean	Upper middle income	184,999	\$1,431,135,704	\$16,138,806	\$87.24	1.13
St. Vincent and the Grenadines	Latin America & Caribbean	Upper middle income	109,462	\$737,683,556	\$8,318,800	\$76.00	1.13
Sudan	Sub-Saharan Africa	Lower middle income	40,234,882	\$97,156,119,150	\$1,928,535,348	\$47.93	1.98
Suriname	Latin America & Caribbean	Upper middle income	542,975	\$5,150,291,217	\$58,079,435	\$106.97	1.13
Swaziland	Sub-Saharan Africa	Lower middle income	1,286,970	\$4,118,488,059	\$81,751,411	\$63.52	1.98
Sweden	Europe & Central Asia	High income	9,798,871	\$496,000,000,000	\$2,188,874,162	\$223.38	0.44
Switzerland	Europe & Central Asia	High income	8,286,976	\$671,000,000,000	\$2,962,059,050	\$357.44	0.44
Tajikistan	Europe & Central Asia	Lower middle income	8,481,855	\$7,853,450,374	\$155,889,889	\$18.38	1.99
Tanzania	Sub-Saharan Africa	Low income	53,470,420	\$45,628,247,290	\$942,350,496	\$17.62	2.06

Country	Region	Income group	2015 Population	2015 GDP (\$)	Expected annual pandemic loss (\$)	Expected annual pandemic loss per capita (\$)	Expected annual pandemic loss (% GNI)
Thailand	East Asia & Pacific	Upper middle income	67,959,359	\$395,000,000,000	\$4,456,278,926	\$65.57	1.13
Togo	Sub-Saharan Africa	Low income	7,304,578	\$4,087,903,913	\$84,426,611	\$11.56	2.07
Tonga	East Asia & Pacific	Lower middle income	106,170	\$435,142,409	\$8,637,516	\$81.36	1.99
Trinidad and Tobago	Latin America & Caribbean	High income	1,360,088	\$23,559,287,484	\$104,032,560	\$76.49	0.44
Tunisia	Middle East & North Africa	Lower middle income	11,107,800	\$43,015,089,723	\$853,843,502	\$76.87	1.99
Turkey	Europe & Central Asia	Upper middle income	78,665,830	\$718,000,000,000	\$8,095,477,153	\$102.91	1.13
Turkmenistan	Europe & Central Asia	Upper middle income	5,373,502	\$35,854,571,429	\$404,329,225	\$75.25	1.13
Uganda	Sub-Saharan Africa	Low income	39,032,383	\$27,529,249,701	\$568,555,744	\$14.57	2.07
Ukraine	Europe & Central Asia	Lower middle income	45,198,200	\$90,615,023,324	\$1,798,695,512	\$39.80	1.99
United Arab Emirates	Middle East & North Africa	High income	9,156,963	\$370,000,000,000	\$1,635,144,558	\$178.57	0.44
United Kingdom	Europe & Central Asia	High income	65,138,232	\$2,860,000,000,000	\$12,633,935,401	\$193.96	0.44
United States	North America	High income	321,418,820	\$18,000,000,000,000	\$79,645,603,339	\$247.79	0.44
Uruguay	Latin America & Caribbean	High income	3,431,555	\$53,442,697,569	\$235,991,034	\$68.77	0.44
Uzbekistan	Europe & Central Asia	Lower middle income	31,299,500	\$66,732,736,498	\$1,324,635,466	\$42.32	1.98
Vanuatu	East Asia & Pacific	Lower middle income	4,422,143	\$742,432,131	\$14,737,174	\$3.33	1.98
Venezuela, RB	Latin America & Caribbean	Upper middle income	31,108,083	\$371,000,000,000	\$4,187,538,585	\$134.61	1.13
Vietnam	East Asia & Pacific	Lower middle income	91,703,800	\$194,000,000,000	\$3,842,913,015	\$41.91	1.98
Virgin Islands (U.S.)	Latin America & Caribbean	High income	103,574	\$3,765,000,000	\$16,625,400	\$160.52	0.44
Yemen, Rep.	Middle East & North Africa	Lower middle income	77,266,814	\$37,733,919,936	\$749,013,022	\$9.69	1.98
Zambia	Sub-Saharan Africa	Lower middle income	16,211,767	\$21,154,394,546	\$419,911,767	\$25.90	1.98
Zimbabwe	Sub-Saharan Africa	Low income	15,602,751	\$14,419,185,900	\$297,796,382	\$19.09	2.07

APPENDIX D—CHANGE MANAGEMENT AND INVESTMENT CASE

How to Use this Document

Target audience

- Country-level preparedness advocates (e.g., Ministry of Health, Ministry of Agriculture, representatives of public health NGOs) who are trying to motivate key stakeholders to allocate resources to planning, costing and financing preparedness activities

Purpose

- Provide preparedness advocates with an overview of formal and non-formal activities that can support preparedness action
- Provide preparedness advocates with a tactical tool to develop the investment case for preparedness in their specific countries

When it should be used

- As a thought-starter to how to catalyze a domestic critical mass to preparedness action
- Prior to any discussions or advocacy opportunities to create buy-in with key stakeholders
- During the communication and/or change management planning processes happening during the process of creating and implementing the National Action Plans for Health Security (NAPHS)

Executive Summary

Stakeholders in development projects often only look at the formal mechanisms that enable project implementation (e.g., financing plans, processes, tracking & monitoring systems). Yet experience suggests these alone are not enough. To catalyze the commitment of resources to deliver an infectious disease preparedness plan, its proponents in each country need broad political and social support. In order to overcome the significant barriers to financing preparedness, countries will require **change leaders**, champions who can shepherd the planning and financing process through the intricate and complex world of priority-setting and decision-making in governments by implementing **change management actions** that include 4 main elements:

- **Championship & sponsorship:** the identification and enablement of leaders to drive the process of improving preparedness capabilities
 - **Expertise & capabilities:** the development of technical expertise and management capabilities to effectively implement prioritized preparedness activities
 - **Formal mechanisms:** infrastructure and processes in place to manage the implementation of preparedness activities
 - **“Burning platform” and the investment case:** the establishment of preparedness as a critically-important initiative and the arguments (investment case) for it that can influence key stakeholders
1. Section 1 of this document gives an overview of the **overall change management activities** that will facilitate preparedness in implementing countries
 2. Section 2 of this document includes a deep dive on how to build a burning platform for preparedness activity by **developing the investment case for preparedness**. This sections includes the following sub-sections:
 - a. Overview of the 3 step process to develop an investment case, which includes: (i) identification of the change leader; (ii) identification of all stakeholders and analysis of their motivations; and (iii) articulation of the essential arguments for prioritizing investments in preparedness in ways that are relevant to the motivations of different stakeholders.
 - b. Detailed argument library that can be used to form the building blocks for investment cases
 - c. Examples of investment cases

Contents of this Document – Overview

- 1 Change management summary
- 2 Guidance on how to build an investment case
 - a Overview
 - b Argument library
 - c Examples of investment cases

Content of this Document – Detail by Section

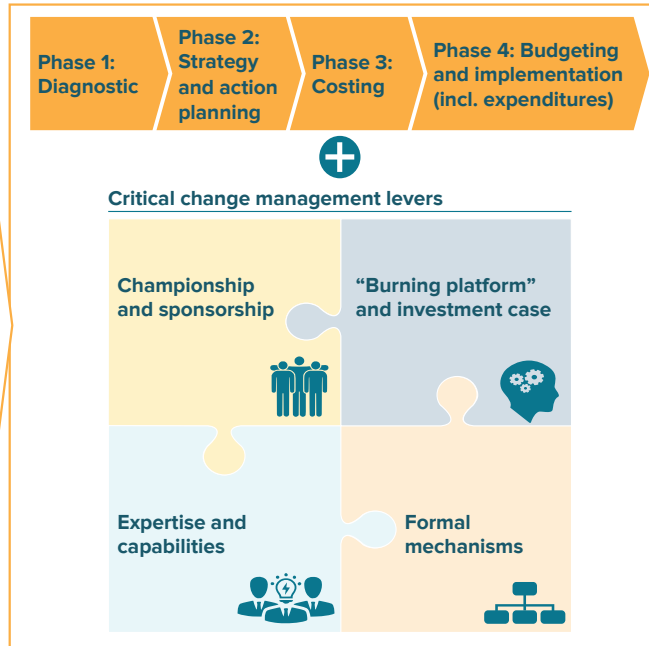
	Section	What this includes	How this can help
1	Change management summary	<ul style="list-style-type: none"> Overview of the building blocks of an effective change management plan Specific suggestions of change management actions, including sequencing and ownership 	<ul style="list-style-type: none"> Provides an overview of the necessary pieces to overcome barriers to preparedness financing and implementation
	2	a Overview	<ul style="list-style-type: none"> Proposed steps to create an investment case Likely audiences of an investment case Overview of 4 main arguments that can be used as components of an investment case
b Argument library		<ul style="list-style-type: none"> Detail of supporting arguments for preparedness that can be used for preparedness, along with fortifying examples 	<ul style="list-style-type: none"> Provides a 'library' of arguments for financing preparedness that can be adopted for different audiences once adapted to the specific country context
c Example investment cases		<ul style="list-style-type: none"> Example investment case from a West African country Example investment case from a South-East Asian country 	<ul style="list-style-type: none"> Could inspire the people who will have to build a case for their own country with some practical narrative examples

Contents of this Document – Overview

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 - b Argument library
 - c Examples of investment cases

To ensure effective implementation, the critical change management levels can be applied to the assessment, planning and implementation process

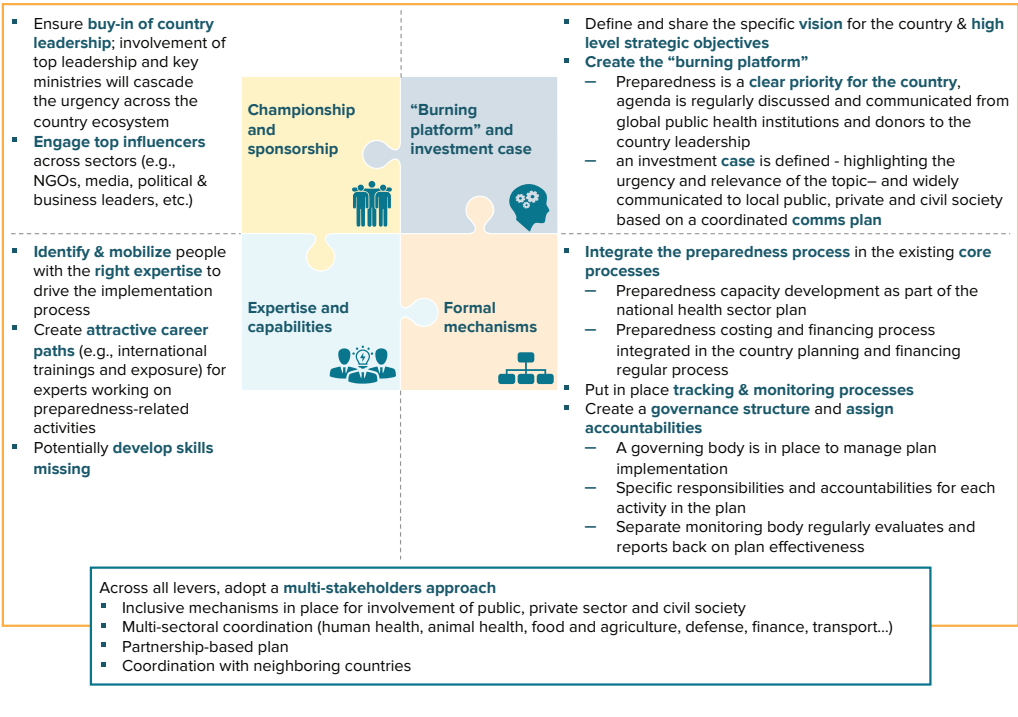
- **Formal mechanisms** (processes, tools, systems) – including financial incentives – are key to supporting implementation at country level
- In addition, other important elements of change management need to be in place, such as:
 - **Championship & sponsorship** by key influencers
 - The right **expertise and capabilities**
 - The **“burning platform” and investment case** for preparedness



Overview of Key Roles

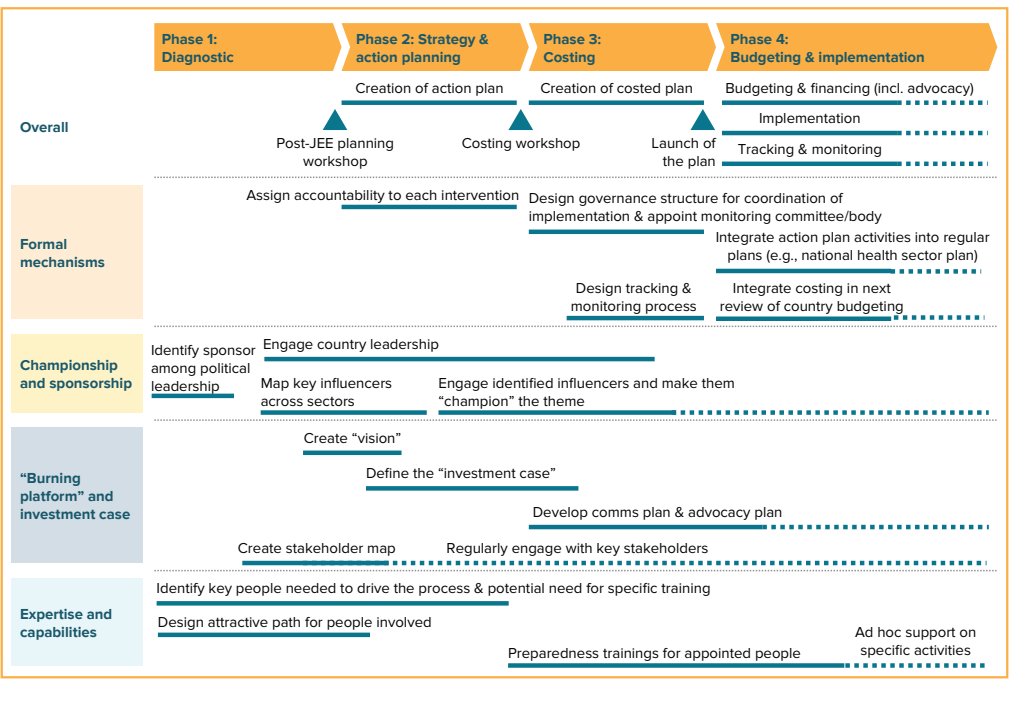
Role	Description
Change leader	<ul style="list-style-type: none"> ▪ The primary champion who leads the change management process and shepherds it through the complex world of priority-setting and decision-making in government
Monitoring committee	<ul style="list-style-type: none"> ▪ The group managed by the change leader that serves as a steering entity ▪ Could include senior representatives of all sectors involved as well as the main donors and regional/global entities
Project Manager	<ul style="list-style-type: none"> ▪ The person responsible for the logistics, planning and activities related to the change management plan (e.g., ensuring regular engagement of key stakeholders, scheduling monitoring committee meetings, managing government approval processes)
International public health community	<ul style="list-style-type: none"> ▪ Local members of international institutions who may be able to provide technical project expertise, process and planning input (e.g., members of WHO, World Bank, Gates Foundation, Red Cross, CDC etc.)
Preparedness activity owners	<ul style="list-style-type: none"> ▪ Individuals selected during the planning process to own the planning and execution of agreed upon preparedness activities (e.g., Ministry of Agriculture ownership of the strengthening of zoonotic disease surveillance) ▪ May include members from the public, private or social sectors
Country leadership	<ul style="list-style-type: none"> ▪ Key government decision-makers, including members of the legislative and executive branches
Private sector	<ul style="list-style-type: none"> ▪ Representatives from key industries that could contribute to preparedness activities or could push the Government to implement preparedness as they would be heavily impacted by an infectious disease outbreak
Technical groups	<ul style="list-style-type: none"> ▪ Regional and domestic groups of experts with capabilities and skills important for preparedness activity execution (e.g., Africa CDC, SE Asia Field Epidemiology and Technology Network)

Levers to Drive Change at the Country Level



High Level Change Management Process at Country Level

ILLUSTRATIVE



High Level Change Management Process at Country Level

Activity	What	Who	When	
Formal mechanisms	Assign accountability to each intervention	<ul style="list-style-type: none"> Each intervention/action outlined in the action plan should have a person accountable for its implementation; additionally, it should be specified which other stakeholders (across sectors) need to be involved or contribute (e.g., Ministry of Health will own biolab capacity-building, Ministry of Agriculture will own zoonotic surveillance capacity) Ideally all accountabilities and responsibilities are defined already in the planning phase 	<ul style="list-style-type: none"> Change leader Multi-sector stakeholders 	Phase 2
	Design governance structure for coordination of implementation & appoint monitoring committee/body	<ul style="list-style-type: none"> Given the multi-sectoral nature of the plan and the fragmented accountabilities across several actors, a project manager should be appointed to track and regularly follow-up on the implementation of the plan and to coordinate actions across sectors; ideally, the project manager works closely with the change leader (e.g. if change leader is the MoH, the project manager should be appointed in the MoH's team) Regular follow-ups and working/ coordination meetings among the main actors have to be planned An appointed monitoring committee/body would serve as steering entity and could include senior representatives of all sectors involved and potentially the main donors and regional/global entities 	<ul style="list-style-type: none"> Change leader Project Manager Monitoring committee 	Phase 3
	Design tracking & monitoring process	<ul style="list-style-type: none"> The implementation of activities against the initial plan should be regularly tracked and monitored: this will be done by the project manager and through the monitoring committee Ideally, milestones and indicators should be defined and agreed already during the planning phase: this would allow clarity on the indicators measured and potentially simplify the reporting requirements of donors (e.g., HSFAT) 	<ul style="list-style-type: none"> Change leader Project Manager 	Phase 3
	Integrate action plan activities into regular plans (e.g., national health sector plan)	<ul style="list-style-type: none"> Once the preparedness activities are defined in the plan and each of them has a responsible person, this person should make sure that activities are integrated into regular plans (e.g., national health sector plan, defense, agriculture, etc.) 	<ul style="list-style-type: none"> Preparedness activity owners Project Manager 	Phase 4
	Integrate costing in next review of country budgeting	<ul style="list-style-type: none"> Costs that are determined to be funded through domestic funds should be included in the next review of the country budgeting, following the inclusion in each of the different plans (as per previous point) 	<ul style="list-style-type: none"> Relevant country budgetary agencies/entities 	Phase 4
Championship and sponsorship	Identify change leader among political leadership	<ul style="list-style-type: none"> The change leader's role is to promote the topic of preparedness, drive the engagement of political leadership and other stakeholders and advocate in the legislature to get dedicated funding Ideally, the change leader is a member of the top leadership in the country (e.g. in the MoF, prime Minister Office or MoH) who is invested in GPH, has credibility within the political landscape and is capable of convening major stakeholders to be involved 	<ul style="list-style-type: none"> International public health community and preparedness advocates in country 	Phase 1
	Map key influencers across sectors	<ul style="list-style-type: none"> Key influencers may be found across different sectors (political leadership, private sector, civil society, partners, both national and international entities); although sometimes these people do not have a formal role in the preparedness agenda, they are key to influence key stakeholders 	<ul style="list-style-type: none"> Change leader 	Starts in Phase 1 and continues until Phase 2
	Engage country leadership	<ul style="list-style-type: none"> The change leader plays a key role in engaging the rest of the country leadership and identifying potential champions amongst them of the preparedness activities (Heads of government ministries, Prime Ministers) 	<ul style="list-style-type: none"> Change leader 	Starts in Phase 1 and continues until Phase 3
	Engage identified influencers and make them "champion" the theme	<ul style="list-style-type: none"> The change leader can start engaging the key influencers and stakeholders, to make them further champion the agenda (e.g., parliamentarians, project leaders with high reach) 	<ul style="list-style-type: none"> Change leader 	Starts in Phase 2 and continues until Phase 4

High Level Change Management Process at Country Level (Cont'd)

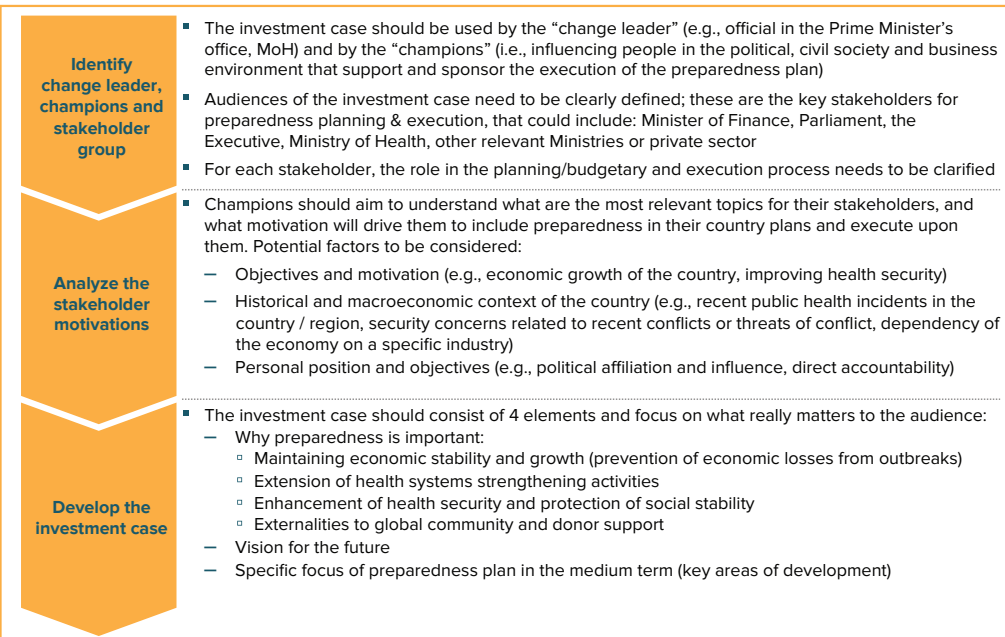
Activity	What	Who	When	
"Burning platform" and investment case	Create stakeholder map	<ul style="list-style-type: none"> A stakeholder map includes a list of all key stakeholders for preparedness planning & execution, that could include: Minister of Finance, Parliament, the Executive, Ministry of Health, other relevant Ministries, private sector, donors and international partners For each stakeholder, it should be clarified: role in the preparedness planning & execution, main motivations and concerns, objectives of the communication 	<ul style="list-style-type: none"> Change leader 	Starts in Phase 1 and continues until Phase 2
	Create "vision"	<ul style="list-style-type: none"> While the action plan outlines the interventions needed to fill identified gaps in the core capacities, leadership in the country should define an overall vision for the evolution of the core capacities for preparedness in the country 	<ul style="list-style-type: none"> Change leader and country leadership 	Starts in Phase 1 and continues until Phase 2
	Regularly engage key stakeholders	<ul style="list-style-type: none"> Champions should check-in with stakeholders identified in the stakeholder map in order to ensure their continued support and stay abreast of stakeholder progress 	<ul style="list-style-type: none"> Change leader and preparedness champions 	Starts in Phase 1 and continues until Phase 4
	Define the investment case	<ul style="list-style-type: none"> An investment case is needed for the change leader and champions of the preparedness agenda to create buy-in and align the different stakeholders An investment case should include elements such as <ul style="list-style-type: none"> Why preparedness is important (including the economic case) What is the vision for the future Specific focus of preparedness plan in the medium term (key areas of development) 	<ul style="list-style-type: none"> Sponsor and preparedness champions 	Starts in Phase 2 and continues until Phase 3
Expertise and capabilities	Identify key people needed to drive the process & potential need for specific training	<ul style="list-style-type: none"> Driving the implementation of the preparedness plan requires specific capacities; key people can be identified among the existing teams (e.g., in the different departments/ ministries and entities involved). In some cases – for example in small countries or countries that have big gaps in their core capacities – expertise can be built with the support of partners or international entities (e.g., through provision of trainings, temporary secondments) 	<ul style="list-style-type: none"> Change leader and preparedness champions Private sector 	Starts in Phase 1 and continues until Phase 2
	Design attractive path for people involved	<ul style="list-style-type: none"> The ability to involve people with the right expertise and capabilities also depends on the attractiveness of the career path linked to a specific program: for example, there could be the possibility to give more international exposure to people driving the implementation of the plan, provide specific trainings/certifications, improve pay for infectious disease experts, increase recognition of infectious disease experts) 	<ul style="list-style-type: none"> Change leader Country leadership Regional/global entities with experience in other countries Technical groups 	Starts in Phase 1 and continues until Phase 2
	Trainings for appointed people and ad hoc support on specific activities	<ul style="list-style-type: none"> Trainings could be provided by regional/global entities that already have experience from implementation in other countries Ad hoc support may include rotations across partner countries, secondments of consultants for a certain period of time 	<ul style="list-style-type: none"> Private sector Regional/ global entities Technical groups Other countries 	Starts in Phase 3 and continues until Phase 4

Contents of this Document – Overview

- 1 Change management summary
- 2 Guidance on how to build an investment case
 - a Overview
 - b Argument library
 - c Examples of investment cases

GUIDANCE ON HOW TO BUILD AN INVESTMENT CASE - OVERVIEW

Through a 3-step process, preparedness champions can create a country-level investment case



Change leaders of preparedness activity will typically develop investment cases for one of the following audiences

Audience	Role in national budgeting process
Ministry of Finance	<ul style="list-style-type: none"> The Ministry of Finance is usually responsible for decisions on the national budget (e.g., prioritization of activities to be funded, financing instruments to fund national activities), economic policy and financial regulation
Parliament	<ul style="list-style-type: none"> Parliament is the governing body electing by citizens that is responsible for policy decisions and usually, to some degree, the national budget
The Executive	<ul style="list-style-type: none"> The executive is the person or entity of a country that has supreme managerial responsibility (e.g., the President, Prime Minister, Monarch) The degree of power and budgetary control that the executive holds varies widely depending on the type of political system a country holds
Ministry of Health	<ul style="list-style-type: none"> The Ministry of Health is the division of a country's government that is responsible for health policy and in most cases, execution of healthcare activity If the Ministry of Health is not already the leader or a champion of preparedness execution, their support will be critical to gain influence in the budgetary process
Other relevant Ministries	<ul style="list-style-type: none"> Several other Ministries may have additional activities to be included in their budget (e.g., Agriculture, Interior/Defense)
Private sector	<ul style="list-style-type: none"> The private sector can serve as funding partners for preparedness activities or influence partners to motivate the government to implement preparedness activities
Bilateral and multilateral donors	<ul style="list-style-type: none"> Donors may provide technical or financial assistance for execution
Neighboring countries	<ul style="list-style-type: none"> Neighboring countries may provide technical assistance or financial collaboration that can reduce the amount for preparedness activities to be included in the national budget
Regional organizations	<ul style="list-style-type: none"> Coalitions and institutions with resources, technical capacity or convening power that can benefit preparedness activity execution in individual countries (e.g., Africa CDC)

We have identified 4 key potential motivations of stakeholders ...

Ensuring economic stability and growth of the country	Strengthening the health system	Improving security and protecting social stability	Managing externalities to regional and global community
<p>Nation's economic and financial stability and growth could be affected by:</p> <ul style="list-style-type: none"> The potential financial and productivity losses resulting from an outbreak The lack of confidence from investors in a country's stability and security 	<p>Preparedness activities directly improve a country's capabilities in the event of a pandemic, at the same time improving a country's health system as a whole</p>	<p>A nation's security can be threatened by</p> <ul style="list-style-type: none"> Loss of health and deaths caused by the spread of infectious diseases Bioterrorism or other malicious induction of a human pandemic <p>Social stability can be disrupted by pandemics</p>	<p>Preparedness is a major public health topic among global institutions and donors, given the high externalities of the level of preparedness of each country</p> <p>International funding (grants and loans) is likely to be mobilized for financing preparedness</p>

In addition, each audience will likely be affected by **personal position and objectives** (e.g., political affiliation and influence, direct accountability, need to prove value in the short term during the time of the political mandate)

... although the 4 motivations are expected to have a different relevance for the different audiences

Low relevance Some relevance Highly relevant

Audience concern	Ensuring economic stability and growth of the country	Strengthening the health system	Improving security and protecting social stability	Managing externalities to regional and global community
Ministry of Finance	Highly relevant	Some relevance	Some relevance	Some relevance
Parliament	Highly relevant	Some relevance	Some relevance	Low relevance
The Executive	Highly relevant	Some relevance	Some relevance	Some relevance
Ministry of Health	Some relevance	Highly relevant	Highly relevant	Some relevance
Other relevant ministries	Some relevance	Some relevance	Some relevance	Low relevance
Private sector	Highly relevant	Low relevance	Highly relevant	Low relevance
Bilateral & multilateral donors	Some relevance	Some relevance	Some relevance	Highly relevant
Neighboring countries	Low relevance	Low relevance	Some relevance	Highly relevant
Regional organizations	Low relevance	Low relevance	Some relevance	Highly relevant

In building the narrative, one should also take into account the **historical and macroeconomic context of the country** (e.g., recent public health incidents in the country / region, security concerns related to recent conflicts or threats of conflict, dependency of the economy on a specific industry, past relationship with international donor agencies)


Contents of this Document – Overview

- 1 Change management summary
- 2 **Guidance on how to build an investment case**
 - a Overview
 - b Argument library**
 - c Examples of investment cases

We have developed an argument library based on the 4 key motivations of stakeholders

i Ensuring economic stability and growth of the country	ii Strengthening the health system	iii Improving security and protecting social stability	iv Managing externalities to regional and global community
<ul style="list-style-type: none"> Preparedness activity requires a relatively small annual spending to prevent or limit extremely high future losses, resulting from: <ul style="list-style-type: none"> Reduced productivity from infected groups and slow-down of economic activity Direct costs of response activities The economic cost of outbreaks can be disproportionately large with respect to the severity of the outbreak if the threat triggers panic reactions (e.g., limits the circulation of goods and people, absenteeism) In addition, even in “non-crises times”, foreign direct investments in certain sectors (e.g., tourism) may be discouraged by a perceived higher risk of epidemic 	<ul style="list-style-type: none"> Strengthening preparedness against disease outbreaks protects the population and contributes to universal health coverage Pandemic preparedness enables improved prevention, detection and response to regularly occurring epidemics, specifically in certain geographical areas (e.g., Meningitis, yellow fever, cholera...) Preparedness activities enable earlier detection and faster response to outbreaks: this has proven to be effective in reducing the spread of infectious diseases (changing the “shape of the curve” of infected people) 	<ul style="list-style-type: none"> Bioterrorism threat: the same activities that improve pandemic preparedness can protect against the risk to bio-security Preparedness activities can reduce the potential loss of key security personnel and/or disruption of capacity to perform security activities Preparedness activities can reduce social disruption that results from infectious disease outbreak, thereby protecting social stability 	<ul style="list-style-type: none"> After the Ebola crisis in 2014–15, the world has realized that preparedness is key to global health security International funders are willing to support investments in public health and may give preferential lending terms and increased funding to countries that prioritize preparedness

i Ensuring Economic Stability and Growth of the Country

 Case examples in Appendix

Arguments for preparedness investment to reduce economic losses

Argument	Detail	Examples to support argument
<p>Relatively small annual spending to prevent or limit extremely high future losses</p>	<ul style="list-style-type: none"> Large epidemics cause extremely high economic costs: <ul style="list-style-type: none"> From reduced productivity and slow-down of the economy, mainly borne by the countries directly affected by the outbreak From direct costs for response, borne by both affected countries and the international community Costs from large epidemics (both direct and indirect) are lower in countries that are better prepared Estimates suggest that the annual cost of preparedness would be around \$4.5 billion, less than \$1 per person 	<ul style="list-style-type: none"> The Ebola epidemic in West Africa resulted in significant economic costs: <ul style="list-style-type: none"> In 2015, Guinea, Liberia and Sierra Leone loss an estimated \$2.2 billion in GDP; this doesn't count the medium-term effect on the countries' economy (e.g., Sierra Leone estimated to have lost 50% of its work force in the private sector)¹ By the end of 2015, \$3.6 billion was spent to fight the Ebola epidemic in West Africa² Other West African countries that experienced Ebola cases during the 2014–2015 outbreak—such as Nigeria—were able to contain the virus and had much more limited economic consequences In its 5-year national action plan for 2017–2021, Tanzania estimated its average preparedness needs to cost ~\$27 million/year (~\$50 per person/ year)

¹“Cost of Ebola epidemic”, CDC 2016
² IBID

i Ensuring Economic Stability and Growth of the Country (Cont'd)

Case examples in Appendix

Arguments for preparedness investment to reduce economic losses

Argument	Detail	Examples to support argument
Economic cost of outbreaks can be disproportionately large to severity of outbreaks	<ul style="list-style-type: none"> The economic cost of outbreaks can be disproportionately large compared to the severity of the outbreak (e.g. measured by the number of people infected, mortality) if the threat triggers panic reactions, (e.g., limits to the circulation of goods and people, absenteeism) 	<ul style="list-style-type: none"> The Asian economy is estimated to have lost \$60 billion as a result of the SARS epidemic, which was mainly driven by losses from tourism and consumer confidence rather than direct costs from the outbreak¹ The West African Ebola epidemic resulted in >33 weeks of education lost due to school closures²
Even in “non-crises times”, FDI may be discouraged	<ul style="list-style-type: none"> Even in “non-crises time”, foreign direct investments may be discouraged by a perceived higher risk of epidemic; this is expected to be driven by consumer confidence (for sectors such as tourism), but also by perceived risk for the business of any company setting up operations in the country (similarly to the consideration of risk of natural disasters) 	<ul style="list-style-type: none"> Travel & tourism can represent a very relevant sector in some developing countries (e.g., it generated >12% of Kenya’s GDP in 2014)³ A 2004 study of 74 countries found that FDI inflows are positively correlated with population health in low- to middle-income countries⁴

¹ “Assessing the Economic Impact and Costs of Flu Pandemics Originating in Asia,” Oxford Economic Forecasting Group, 2005

² “Cost of the Ebola epidemic,” CDC, 2016

³ “Kenya benchmarking report,” World Travel & Tourism Council, 2015

⁴ “Population Health and Foreign Direct Investment: Does Poor Health Signal Poor Government Effectiveness?,” Asian Development Bank, 2005

ii Strengthening the Health System

Arguments for preparedness investment to reduce economic losses

Argument	Detail	Examples to support argument
Protection of the population and contribution to UHC	<ul style="list-style-type: none"> Few preparedness activities are specific to the prevention, detection and response of pandemics; most activities will—to some extent—enhance existing health system strengthening activities (e.g. surveillance, labs, HCWs trainings) 	<ul style="list-style-type: none"> Tanzania’s recently-produced pandemic preparedness plan calls for improvements in food & water contamination control, safe waste management and workforce training for health workers (e.g., epidemiologists, lab, risk comms)
Improved prevention, detection and response to regularly occurring pandemics	<ul style="list-style-type: none"> Pandemic preparedness activity enables implementing countries to respond more quickly and effectively to regularly occurring epidemics, which can reduce the human and economic impact of these outbreaks 	<ul style="list-style-type: none"> Outbreaks of infectious diseases such as cholera, meningitis, yellow fever, MERS CoV and others happen every year, particularly in vulnerable countries: their effect can be limited through prevention and early detection and response that are enabled by better preparedness A high number of people is still infected by largely domestic, recurring infectious diseases: for example, in 2016 Tanzania experienced a cholera outbreak (>24,000 cases)¹ and Angola suffered from a big yellow fever outbreak
Reduction in the spread of infectious diseases once an outbreaks starts	<ul style="list-style-type: none"> Preparedness activities enable earlier detection and faster response to outbreaks; this has proven to be effective in reducing the spread of infectious diseases (changing the “shape of the curve” of infected people) 	<ul style="list-style-type: none"> A recent study shows that in response to meningitis outbreaks, a shorter response time (4 weeks instead of 6 weeks to reach desired coverage) could increase the number of averted cases by 218%² The 2015 MERS outbreak in South Korea resulted in 186 cases and 38 deaths from the infection, while neighboring Thailand, which was able to catch the presence of the disease early with its surveillance infrastructure, only saw 3 cases³

¹ “Cholera—United Republic of Tanzania,” WHO, 2016

² Response thresholds for epidemic meningitis in sub-Saharan Africa following the introduction of MenAfriVac® Vaccine, Volume 33, Issue 46, Pages 6212–6217 (2015)

³ “Costly Lessons From the 2015 Middle East Respiratory Syndrome Coronavirus Outbreak in Korea,” PMC, 2015; “MERS-CoV- Thailand, WHO, 2016; “Nuclear, Biological, and Chemical Weapons and Missiles: Status and Trends,” CRS Report for Congress, 2008

iii Improving Security and Protecting Social Stability

Arguments for preparedness investment to improve health security

Argument	Detail	Examples to support argument
Protection against the risk to biosecurity	<ul style="list-style-type: none"> The same activities that would improve pandemic preparedness could improve bio-security by limiting the threat of bioterrorism 	<ul style="list-style-type: none"> The US Department of Defense has funded CDC bio surveillance activities in acknowledgement of the public health institution's role in bioterrorism preparedness 16 countries have had or are currently suspecting of having biological weapons¹ which could be used in the event of a conflict
Minimization of disruption of capacity to perform security activities	<ul style="list-style-type: none"> Health emergencies may significantly hinder the capacity of a nation to perform its security activities, e.g., due to the loss of key personnel 	<ul style="list-style-type: none"> Militaries frequently experience infectious disease outbreaks; recent infectious disease outbreaks during military deployments include: <ul style="list-style-type: none"> Nipah virus infected Malaysian military personnel during their deployment to respond to the infectious disease infection of pig farmers³ Average 21% Hepatitis E infection rate in Thai peacekeeping troops deployed in East Timor, Afghanistan and Iraq between 1999 and 2006²
Protect social stability	<ul style="list-style-type: none"> Preparedness activities can reduce social disruption that results from infectious disease outbreak, thereby protecting social stability 	<ul style="list-style-type: none"> The Ebola epidemic had a negative social impact on the lives of children in Sierra Leone, Guinea and Liberia: <ul style="list-style-type: none"> >33 weeks of education were lost due to school closures 17,300 children lost one or both parents to Ebola There was a 30% decline in childhood vaccination coverage during as a result of the outbreak⁴

¹ "The biological threat," Nuclear Initiative, December 30, 2015

² "Hepatitis E Virus Infection in Thai Troops Deployed with U.N. Peacekeeping Forces," Military Medicine 2007

³ "Nipah Virus Infection Among Military Personnel Involved in Pig Culling during an Outbreak of Encephalitis in Malaysia, 1998–1999," Emerging Infectious Disease, 2001

https://wwwnc.cdc.gov/eid/article/7/4/01-7433_article

⁴ "Cost of the Ebola epidemic," CDC, 2016

iv Managing Externalities to Regional and Global Community

Arguments for preparedness investment to manage externalities to regional and global community

Argument	Detail	Examples to support argument
Increased focus on global health security	<ul style="list-style-type: none"> After the Ebola crisis in 2014–15, the world has realized that preparedness is key to global health security 	<ul style="list-style-type: none"> The 2016 G7 Ise-Shima Leaders' Declaration included detailed language reinforcing the G7 commitment to support "strong health systems and better preparedness" in LICs and LMICs
Willingness to support investments in public health	<ul style="list-style-type: none"> International donors may give preferential lending terms and increased funding to countries that prioritize preparedness 	<ul style="list-style-type: none"> The IWG is recommending that preparedness indicators be included in World Bank loan decisions and that other banks and funding institutions include preparedness in its terms to implementing countries

SOURCE: "G7 Ise-Shima Leaders' Declaration," White House, 2016

Contents of this Document – Overview

- 1 Change management summary
- 2 Guidance on how to build an investment case
 - a Overview
 - b Argument library
 - c Examples of investment cases

EXAMPLES OF INVESTMENT CASE

ILLUSTRATIVE

Change leaders can develop investment cases by selecting arguments from the library that are most relevant to their audience

Audience concern	Ensuring economic health and growth of the country	Strengthening the health system	Improving health security and protecting social stability	Managing externalities to regional and global community
Audience				
Ministry of Finance	<ul style="list-style-type: none"> Prevent future productivity & financial losses from pandemics 	<ul style="list-style-type: none"> Enable HSS through low cost activities with high externalities 		<ul style="list-style-type: none"> Become more attractive to donors and improve lending terms
Parliament	<ul style="list-style-type: none"> Strengthen the economy through investment in workforce resilience 	<ul style="list-style-type: none"> Improve constituent livelihood through investment in workforce resilience 	<ul style="list-style-type: none"> Defend against any malicious introduction of pandemic from internal or external enemies of the state 	<ul style="list-style-type: none"> Improve reputational standing with international donors
The Executive				
Ministry of Health		<ul style="list-style-type: none"> Improve lives of citizens through a stronger health system 		
Private sector	<ul style="list-style-type: none"> Reduce impact of a pandemic on productivity and bottom line 	<ul style="list-style-type: none"> Improve workforce security in the event of a pandemic 		

Example Investment Case: A Large West African Country (1/2)

Country context	Developing the investment case
<p>Economy</p> <ul style="list-style-type: none"> This country is currently in its second year of economic recession, brought on by low oil prices The 3 largest sectors of this country's economy are: <ul style="list-style-type: none"> Trade Agriculture Information and Communications¹ Any new debt (e.g., development assistance loans) must be passed through the parliamentary body for approval⁶ <p>Public health</p> <ul style="list-style-type: none"> This country currently contributes >1% of its GDP to health, significantly less than other lower-income countries² This country has completed the PVS assessment but not the JEE assessment³ <p>Current events</p> <ul style="list-style-type: none"> This country is currently experiencing a vaccine-preventable disease outbreak that has resulted in hundreds of deaths which experts suggest could have been reduced with better surveillance, a core capacity of pandemic preparedness activity⁴ In 2016, a conflict region of the country experienced an outbreak of a vaccine-preventable infectious disease, which had gone undetected for over 2 years⁵ 	<div style="text-align: center; background-color: #f4a460; padding: 5px; margin-bottom: 10px;"> Identify change leader, champions and stakeholder groups </div> <ul style="list-style-type: none"> The Ministry of Health would likely be the natural sponsor for championing preparedness activity After identifying its priority preparedness action areas, the MoH's objective will be to secure financing for prioritized preparedness activities The primary audiences for the case would be the Ministry of Finance and the parliamentary body, as both stakeholders' approval is required for any new budgetary requests <hr/> <div style="text-align: center; background-color: #f4a460; padding: 5px; margin-bottom: 10px;"> Establish the stakeholder motivations </div> <ul style="list-style-type: none"> Objectives and motivation <ul style="list-style-type: none"> The Ministry of Finance will be most interested in the economic growth of the country and the economic case for enacting the preparedness plan Historical and macroeconomic country insights <ul style="list-style-type: none"> The Ebola outbreak is a high-impact example of the human and economic devastation that can result from an infectious disease outbreak, both in-country and across the West African region Recent outbreaks of vaccine-preventable diseases are topical reminders of the existence and impact of preparedness gaps Personal position and objectives <ul style="list-style-type: none"> As administration appointees, Ministers of Finance may be more sensitive to the Executive's position on discretionary budget issues National Assembly members may be particularly interested in supporting highly visible initiatives when they are up for re-election <hr/> <div style="text-align: center; background-color: #f4a460; padding: 5px;"> Develop the investment case </div> <ul style="list-style-type: none"> Deep dive on following page

1 "[Country] Economic Report," World Bank, 2015;
 3 World Health Organization, 2017;
 5 WHO website, 2016;

2 "Health expenditure public (% GDP)," World Bank website, 2017
 4 WHO website, 2017
 6 Expert interviews

Example Investment Case: A Large West African Country (2/2)

Potential investment case for the Ministry of Finance

We understand the difficulties of ensuring the growth of our economy and believe that health emergency preparedness is essentially important to that effort.

Our country has recently experienced public health emergencies that highlight the human and economic consequences of infectious disease outbreaks. In addition to the immeasurable losses of human life, \$3.4 billion was spent to fight the 2014 Ebola epidemic in the 3 hardest hit countries (Guinea, Sierra Leone, Liberia), and even though we were able to detect and contain it, our economy was also impacted by the outbreak; many commercial business saw declines during the Ebola crisis.² Infectious disease outbreaks of varying severity hit the West Africa region regularly, and we are currently experiencing the worst outbreak of a commonly-occurring infectious disease that we have seen in recent years, from which hundreds of people have already died¹ and for which the economic costs have not yet been estimated.

Health emergency preparedness can reduce the direct costs of responding to infectious disease outbreaks and reduce non-direct productivity losses. Preparedness activities—like further improving our country's surveillance capabilities—would allow our public health officials to catch outbreaks and contain them more quickly, thus drastically reducing human and economic losses in the process. For example, a recent study shows that in response to meningitis outbreaks, a shorter response time (4 weeks instead of 6 weeks to reach desired coverage) could increase the number of averted cases by 218%.⁴

In addition to the lives and direct costs that we could save from improving our health emergency preparedness infrastructure, we could also reduce productivity losses from pandemic outbreaks. For example, on top of the \$3.4 billion in direct costs that went into fighting the pandemic, the 3 nations hardest hit by Ebola also faced \$2.2 billion in productivity losses.³ Our country did not face such severe losses because we were able to detect the outbreak early; however, we can do even more to strengthen our preparedness infrastructure.

Investing in preparedness does not only affect human health; several outbreaks are due to zoonotic diseases: investing in preparedness will therefore also reduce risks for our animal population and enhance our ability to trade livestock internationally. As a nation for whom agriculture is one of the biggest sectors and for whose poor households often count livestock as their most important assets, this is an economic and human risk that we should take steps to reduce.

[...]

1 WHO website, 2017

2 "The Economic Impact of the 2014 Ebola Epidemic: Short and Medium Term Estimates for West Africa," World Bank, 2014

3 IBID

4 Response thresholds for epidemic meningitis in sub-Saharan Africa following the introduction of MenAfriVac® Vaccine, Vaccine, Volume 33, Issue 46, Pages 6212–6217 (2015)

i Ebola Response Case Study: Economic Impact in Nigeria and Sierra Leone

Context		Key Insights
<ul style="list-style-type: none"> The Ebola outbreak in West Africa was first reported in March 2014; it rapidly spread to over 28,000 cases, becoming the deadliest Ebola outbreak since the virus' discovery in 1976 Although isolated cases of the virus were seen in other parts of the world, the virus primarily affected West Africa; Liberia, Sierra Leone and Guinea all faced heavy economic and human loss while Nigeria, Uganda and DRC were able to contain the virus and its impact 		<ul style="list-style-type: none"> Nigeria was affected by Ebola when the alert had already been raised in other countries in West Africa; however, having a pandemic response infrastructure in place in advance of the Ebola outbreak helped preventing substantial loss of human lives and to the country's economy The WHO attributes Nigeria's successful Ebola outbreak response to: <ul style="list-style-type: none"> The existence of a highly skilled virology lab High quality contact tracing by experienced epidemiologists Establishment of a centralized incident management and response center Strong community outreach strategy that de-stigmatized the response
Sierra Leone	<p>Response</p> <ul style="list-style-type: none"> Ebola cases were not recognized or contained quickly, which exacerbated the virus' spread Community awareness campaigns on the symptoms and responses to the outbreak were not executed until several months after the first incident <p>Economic impact</p> <ul style="list-style-type: none"> The Sierra Leone government was expected to have foregone \$920 million in loss GDP in 2015 as a result of the outbreak The country saw over 12,900 reported cases and over 8,000 deaths, 221 of whom were healthcare personnel 	
Nigeria	<p>Response</p> <ul style="list-style-type: none"> In July, the Ebola virus was introduced to Lagos, a very dense urban city that would normally make the virus difficult to contain Nigeria immediately allocated funds for response and dispersed them quickly for public information campaigns and special treatment facilities Infrastructure in place for polio eradication were repurposed to support the Ebola response, putting GPS systems to work for real-time contact tracing and daily mapping of transmission chains <p>Economic impact</p> <ul style="list-style-type: none"> Nigeria contained the outbreak to 19 cases and 7 deaths Nigerian epidemiologists were able to link the case back to an air traveler from Liberia and reach 100% contact tracing in Lagos The WHO declared Nigeria Ebola free in October of 2014 	

SOURCE: Ebola: "Most African Countries Avoid Major Economic Loss but Impact on Guinea, Liberia, Sierra Leone Remains Crippling," World Bank, 2015; "Cost of the Ebola epidemic," CDC, 2016; The Economic Impact of the 2014 Ebola Epidemic: Short and Medium Term Estimates for West Africa," World Bank, 2014; "Successful Ebola Responses in Nigeria, Senegal and Mali," WHO, 2015; "Ebola containment and prevention: Nigeria provides lessons for the world," CovAfrica, 2014

EXAMPLES OF INVESTMENT CASE

Example Investment Case: A SE Asian Country (1/2)

ILLUSTRATIVE

Country context	Developing the investment case
<p>Economy</p> <ul style="list-style-type: none"> This country's top 3 major exports in 2016 were: <ul style="list-style-type: none"> Telephones & mobile phones Textiles & garments Computers & electronic products¹ The travel and tourism industry contributed ~14% to this country's GDP in 2015² <p>Public health</p> <ul style="list-style-type: none"> This country's share of GDP spent on health is ~60% more than the average of other lower-middle income countries³ This country has completed both the PVS and JEE assessment and is working with the WHO to develop a costed NAPHS⁴ This country is a member of the Mekong Basin Disease Surveillance Network, which is a consortium of 6 neighboring countries to collaborate on infectious disease surveillance and control <p>Current events</p> <ul style="list-style-type: none"> In February 2017, a zoonotic disease killed thousands of chickens after 4 months of no reported outbreaks⁵ 	<p>Identify change leader, champions and stakeholder groups</p> <ul style="list-style-type: none"> The Ministry of Health would be the sponsor for championing preparedness activity After identifying its priority preparedness action areas, the MoH's objective will be to secure financing for prioritized preparedness activities The primary audiences for the case would be first, the Ministries of Agriculture, Finance and Defense and then, after buy-in assured among these, the final audience would be the government <hr/> <p>Establish the stakeholder motivations</p> <ul style="list-style-type: none"> Objectives and motivation <ul style="list-style-type: none"> The Ministry of Finance will be most interested in the economic case for enacting the preparedness plan The Ministries of Agriculture and Defense will be particularly interested in the impacts of preparedness on the agriculture industry and national security, respectively Historical and macroeconomic country insights <ul style="list-style-type: none"> The tourism industry is a large and growing part of this country's economy that could be severely jeopardized by an infectious disease outbreak This country's demonstrated prioritization of public health (e.g. high health spending as percentage of GDP, membership in regional surveillance network) can be the logical foundation for further health investment Personal position and objectives <ul style="list-style-type: none"> As administration appointees, Ministers of Agriculture and Defense may be more sensitive to the Executive's position on discretionary budget issues <hr/> <p>Develop the investment case</p> <ul style="list-style-type: none"> Deep dive on following page

¹ [Country], The Economist Intelligence Unit, 2017.

² "Travel & tourism economic impact 2016, [Country]," World Travel & Tourism Council, 2016

³ "Health expenditure public (% GDP)," World Bank, 2017;

⁴ WHO;

⁵ Media reports, February, 2017

Example Investment Case: A SE Asian Country (2/2)

Potential investment case for the Ministry of Agriculture, Ministry of Finance and Ministry of Defense

Our country's economic growth in the past few decades has been among the fastest in the world.¹ Pandemic preparedness will allow us to complement our positive growth trajectory by de-risking the human, animal and economic losses that could result from infectious disease outbreaks.

Investing in preparedness could allow us to catch the presence of infectious disease sooner, allowing us to reduce the potential loss of human lives that can result from infectious disease outbreaks. For example, The 2015 MERS outbreak in South Korea resulted in 186 cases and 38 deaths from the infection, while neighboring Thailand, which was able to catch the presence of the disease early with its surveillance infrastructure, only saw 3 cases.²

Additionally, investing in preparedness could reduce the impact of infectious diseases on our agricultural sector. The recent zoonotic disease outbreak that we witnessed in February 2017, which resulted in the deaths of thousands of chickens,³ underscores our nation's vulnerability to emerging epidemic threats. The recent outbreak did not reach the human population, however it did impact our agricultural exports: in April the government of a large Middle Eastern country halted the import of poultry from our country.⁴ Infectious diseases' impact to our economy can be significant: according to a 2005 study found that H5N1's impact on the poultry sector in Cambodia, Thailand and Vietnam amounted to \$560 million.⁵

Infectious diseases can have significant economic impact beyond the agricultural sector. For example, the economic impact of the MERS outbreak was so severe in South Korea in 2015 that the government drew up a \$9bn supplementary government to respond, with much of the budget aimed at supporting the South Korean service sector, which had suffered from reduced consumer confidence.⁶

The tourism industry is particularly susceptible to fears of infectious diseases. The travel & tourism industry contributed to ~14% of our country's GDP in 2015⁷ and could be severely impacted should an outbreak occur that we do not catch and contain early.

We have already shown our commitment preparedness by joining the Mekong Basin Disease Surveillance Network. Let us further our efforts by financing priority preparedness activities. We cannot afford not to, as this is a tangible threat to the health of our citizens, people in the Region and the economy of our nation.

[...]

1 Country overview, World Bank website, 2017

2 "Costly Lessons From the 2015 Middle East Respiratory Syndrome Coronavirus Outbreak in Korea," PMC, 2015; "MERS-CoV- Thailand," WHO, 2016

3 Media reports, February 2017

4 Media reports, 2017

5 "Human H5N1 influenza infections in Cambodia 2005–2011: case series and cost-of-illness," BMC Public Health, 2013

6 "South Korea to spend \$9bn to counter MERS impact," Financial Times, June 24, 2015

7 "Travel & tourism economic impact 2016, [Country]," World Travel & Tourism Council, 2016

i Case Study: SARS in Asia, 2002–2003

The case of SARS demonstrates how economic impact is more than proportional to severity of the infection ...

\$60bn

Economic loss

- \$20bn loss in terms of GDP difference
- Additional cost related to gross expenditure and business losses

<8,500

- Cases, with mortality rate of 9.6%

- Economic costs spread across a large part of Asia (e.g., Thailand's economy was badly hit although there were no reported cases)

... due to the reaction of people and Governments to the threat

Drivers of the economic impact:

- Losses from tourism
- Loss of consumer confidence and spend
- Increased Government spending for prevention and response
- Decrease in exports and loss of business confidence
- Absenteeism and closure of schools

