



ANALYSIS

Post-Ebola reforms: ample analysis, inadequate action

Reports on the response to Ebola broadly agree on what needs to be done to deal with disease outbreaks. But **Suerie Moon and colleagues** find that the world is not yet prepared for future outbreaks

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In August 2014, the World Health Organization (WHO) declared the Ebola outbreak in west Africa a public health emergency of international concern, and the world scrambled to respond.

Better preparedness and a faster, more coordinated response could have prevented most of the 11 000 deaths directly attributed to Ebola and also the broader economic, social, and health crises that ensued. In the aftermath of this collective failure, numerous reports were published reviewing what went wrong and how infectious disease outbreaks should be better managed.

An enormous amount of analysis has been done: as at December 2016, more than 40 targeted examinations¹ had been published, which largely agree on the priority actions.² The global community has also launched several initiatives that begin to fill the identified gaps. Yet, despite the great interest in ensuring progress, a clear picture of what has actually been achieved is elusive. Given the importance of improving our ability to battle current (Zika, yellow fever, etc) and future outbreaks of infectious disease, we examined seven major reports and identified areas of consensus on action. We then assessed what progress has been made and what can be done to address the gaps.

The seven reports were selected on the following criteria: scope (tackling problems beyond a single organisation, country, or

sector); diverse authorship (defined by country of origin, organisational affiliation, area of expertise, and gender); and public availability (excluding internal reviews) (table 1^{||}).³⁻¹¹

We grouped recommendations under key themes (table 2^{||}) and identified the greatest areas of progress and stasis.

Compliance with International Health Regulations

All the reports identified inadequate compliance with WHO's International Health Regulations (IHR) as a major contributor to the slow response to Ebola. The regulations are an international treaty for managing infectious disease outbreaks, in which 196 countries agreed, among other things, to develop core capacities to prevent, detect, and respond to outbreaks, to report outbreaks rapidly to WHO, and to limit trade or travel restrictions based on public health or scientific principles. The reports highlight three major challenges to compliance: countries' core capacities, unjustified trade and travel restrictions, and inability to ensure that governments report outbreaks quickly.

Core capacities

The regulations require countries to assess their capacities for disease surveillance and response and to report whether these

are sufficient to meet their obligations. The Ebola reports broadly agree that self assessment is inadequate and that we need more robust means of verification. An important problem is the inadequate level of core capacities in some countries, and how to strengthen, finance, and sustain them. The reports make several recommendations to encourage governments to increase investment in national capabilities to detect, prevent, and respond to outbreaks. These include external technical help conditional on mobilising domestic resources, external financing for the poorest countries, normative pressure from international leaders to increase investment, and adding outbreak preparedness as a factor in the International Monetary Fund's country economic assessments, which influence governments' budget priorities and access to capital markets.¹²

Much work has been done in this area. In February 2016, WHO issued the Joint External Evaluation tool for voluntary external assessments of national core capacities (P A Sands, O Kuivasniemi, personal communication, 2016).¹³ Thirty four countries (low, middle, and high income) have already been assessed using the tool or its predecessor, the Global Health Security Agenda tool (table 3⇓), with 31 countries scheduled for 2017; 129 countries are not yet scheduled, though around two dozen of these have expressed interest.^{14 15} The Alliance for Country Assessments for Global Health Security and IHR are providing peer support for the assessments and resulting action plans. This is substantial progress given the political sensitivity of external evaluation of a nation's internal capabilities. Nevertheless, whether the countries that most need to enhance their core capacities will be open to assessment remains to be seen.

Much work remains to ensure that adequate financing and technical assistance are available for countries that need them. Ensuring adequate capacities worldwide is estimated to cost \$3.4bn (£2.8bn; €3.2bn) annually, much less than the \$60bn-570bn estimated to be lost each year from pandemics.^{8 16}

Several initiatives have been launched to provide funding. The G7 committed to assisting 76 countries at the 2015 and 2016 summits.¹⁷ Substantial funding has also come from the US, which announced \$1bn for building capacities in 31 countries,¹⁸ and South Korea, which announced \$100m for 13 countries.¹⁹ The World Bank has sought funding to assist at least 25 countries with pandemic preparedness plans in its latest financing round²⁰ and established an international working group on financing preparedness in November 2016. The group will consider how to mobilise both domestic resources and development assistance, and will report in June 2017.

However, no systematic mechanism exists to track investments in building core capacity, and the existing data are poor. Furthermore, the US and Korean commitments are one time funding allocations with no guarantee that they will be sustained. The resulting risks are well illustrated by the US, where partisan politics delayed Zika funding by seven months, forcing public health actors to use funds allocated to Ebola.²¹ Investment is likely to continue to fall short of estimated need.⁸

Trade and travel

The second major problem is ensuring that trade and travel restrictions during outbreaks are justified. Fuelled by intense public concern and media attention, many governments and private companies restricted trade and travel during the Ebola outbreak, though many of these measures were not warranted on scientific or public health grounds. These restrictions exacerbated economic repercussions and made it harder for aid organisations to send support to affected regions.

We identified broad consensus across the reports that minimising such restrictions is critical to avoid isolating and economically punishing countries that experience outbreaks. Furthermore, if governments assume that reporting will lead to unwarranted trade and travel restrictions, they may be less forthcoming.

Potential solutions range from WHO and the UN more assertively "naming and shaming" countries and private companies that impose unjustified restrictions on WHO working with the World Trade Organization, International Civil Aviation Organization, and International Maritime Organization to develop standards and enforcement mechanisms for trade and travel restrictions.⁴⁻¹⁰ These organisations have held discussions, but they have not announced any initiatives. The IHR are not binding for private companies, underscoring the need for other guidelines to keep airlines, shipping, and other key industries operating during outbreaks; none have been announced. Non-binding guidelines may not suffice, but developing more specific expectations and compliance mechanisms that can be tested in future outbreaks will be a step forward.

Outbreak reporting

The third compliance issue concerns countries' obligation to report outbreaks swiftly. The reports recommend reinforcing this obligation by WHO publicising when countries delay reporting suspected outbreaks and ensuring that countries rapidly receive operational and financial support as soon as they do report.

A new incentive for early reporting is the World Bank's Pandemic Emergency Financing Facility, created to provide rapid financing for outbreak control and to protect countries from the high economic costs of outbreaks through an insurance mechanism. It has received pledges of \$50m from Japan and €65m from Germany, which is expected to cover most of its start-up costs.²² Its speed and effectiveness cannot be tested until the next outbreak strikes. The extent to which WHO will publicly call on governments to report outbreaks or refrain from excessive trade and travel restrictions will depend on who is elected the next director general in May 2017.

Improving knowledge sharing and research

The reports recognise that timely sharing of knowledge, research, and health technologies is crucial for both preventing future outbreaks and mitigating the effects of existing outbreaks. Several reports outline problems with how individuals, organisations, and countries handled epidemiological, genomic, clinical, and clinical trial data, as well as patient samples, during and after the Ebola outbreak. For example, there was no platform for exchanging epidemiological data between the governments of the three most affected countries. Although some researchers published genomic sequencing data from virus samples early in the outbreak, others delayed putting similar information into the public domain, thereby slowing collective understanding of the causative agent and its evolution.²³ Effective strategies for community mobilisation that had been developed in central Africa were not shared or applied quickly in west Africa.²⁴

Another failure was the lack of adequate research into the Ebola virus before the 2014 outbreak, which left the world without needed drugs, vaccines, and rapid diagnostic tests. Organisations such as the European Innovative Medicines Initiative and the US Biomedical Advanced Research and Development Authority have invested in these areas, but the US National Academy of

Medicine report estimated an ongoing investment gap of \$1bn a year.⁸

Even when research was carried out for the Ebola emergency—including the rVSV vaccine trial in Guinea that recently published positive results²⁵—experts disagreed on acceptable designs for clinical trials, and the regulatory pathways for product approval were unclear. In the absence of clear guidelines on using the scarce supply of existing experimental therapies, west Africa had minimal access to them.

The reports call for developing policies and platforms for exchanging best practices for mobilising communities and delivering care, for sharing research findings, and for modifying the Pandemic Influenza Preparedness (PIP) Framework—which governs the sharing of flu virus samples and related benefits—to include other pathogens such as Ebola and to be made legally binding. They also recommend increasing international public funding for research on pathogens that are likely to cause epidemics (because market incentives do not drive investment for diseases that primarily affect poor countries or occur sporadically), improving equitable access to technologies, and building local research capacity.

Encouragingly, some of the proposed solutions were incorporated in the response to Zika. In September 2015, WHO convened a meeting of researchers, who agreed that rapid, open data sharing should be standard in emergencies.²⁶ The International Committee of Medical Journal Editors subsequently confirmed that publishing relevant data in a health emergency would not prejudice later publication.²⁷ The WHO Bulletin has since launched the ZikaOpen platform to make research on Zika more rapidly available.²⁸

WHO and Médecins Sans Frontières have been working together to create a virtual biobank for existing Ebola samples. However, no framework has been agreed for the management or sharing of samples relevant to health emergencies, and a committee convened by WHO recommended, at the end of 2016, against expanding the PIP Framework beyond influenza.²⁹ No negotiations have been started for alternative arrangements for sample sharing. How best practices on community mobilisation will be incorporated into international responses in the future is unclear.

For future research, WHO has created a list of priority pathogens, mappings of research and development pipelines (starting with Zika and MERS), and target product profiles for Zika. WHO has also organised a working group to develop vaccine trial designs for priority pathogens. The US National Academies of Science, Engineering, and Medicine are studying what worked and what didn't in the vaccine clinical trials during the Ebola outbreak and are planning an initiative to coordinate clinical trial designs and regulatory frameworks.³⁰

Substantial efforts are also under way to increase funding for research and development and for stockpiling existing products. The Coalition for Epidemic Preparedness Innovations (CEPI), which has an initial focus on vaccines for the MERS, Lassa, and Nipah viruses, announced in January 2017 that it had raised \$460m from Norway, Japan, Germany, the Wellcome Trust, and the Bill and Melinda Gates Foundation, with a five year goal of \$1bn. India is finalising its contribution, and the European Commission plans to cofund projects with CEPI.³¹ In early 2016 the Gavi Alliance announced a \$5m payment to Merck to ensure adequate production of the rVSV vaccine in case of a resurgence of Ebola.³² Beyond vaccines, funding shortages remain for research into drugs, diagnostics, and other health technologies, such as personal protective equipment. And

even if products are successfully developed, international arrangements to ensure equitable access are lacking.

Strengthening WHO, UN, and broader humanitarian systems

All reports agreed that WHO and the broader UN and humanitarian systems needed to be strengthened after their inadequate response to the Ebola emergency. Although the reports supported maintaining WHO's role as the leader of global preparedness and response for disease outbreaks, they agreed that it needs substantial reform to do so credibly. They identified operational problems related to WHO's ability to tackle disease outbreaks on the ground as well as broader, institutional problems that are not limited to emergencies or outbreaks.

Operational problems

The reports generally agreed that WHO was unable to respond rapidly to outbreaks partly because it lacked the technical capacity and partly because it lacked an "emergency culture" that could make decisions quickly, work with a broad set of partners, and be relatively flexible in its approach. Their recommendations included enhancing WHO's operational capacity and its ability to issue technical and normative guidance and coordinate with others. The reports called for an emergency centre with dedicated funding, clear lines of command from headquarters to regional and national offices, and strong mechanisms for accountability through a board separate from WHO's two existing governing bodies (the executive board and the World Health Assembly).

WHO responded by establishing a new emergency programme that incorporates its capacity to respond to disease outbreaks (Global Outbreak and Response Network), humanitarian assistance (foreign medical teams), and its health cluster leadership role under the Office for the Coordination of Humanitarian Affairs.³³ The programme is governed by an independent oversight and advisory committee³⁴ and has already led WHO responses to a series of crises, including cholera in Haiti; yellow fever in Angola, Uganda, and the Democratic Republic of the Congo; and the Zika outbreak. WHO has also fostered emergency medical teams to provide surge support to national health systems, with about 75 medical teams on standby, and has developed a formal process of quality control for selection, training, and verification of the teams.³⁵

WHO has created a contingency fund to provide rapid funding in emergencies, with a target of \$100m. To date it has received only \$31.5m, much of which is already committed to ongoing crises. Of the \$1.24bn WHO requested for specific ongoing emergencies and the broader emergency programme, member states had provided only about 41% as at December 2016.³⁶ This lacklustre response reflects the continuing instability of WHO's emergency capacity.

Institutional problems

Institutional problems identified in the reports include unstable financing, minimal transparency, human resource shortcomings, and little accountability after failure. The reports recommend that WHO focus more on core functions; reform its management of human resources; increase transparency and accountability through a freedom of information policy; create an inspector general role; and marshal more effective leadership.

Several reports also emphasised safeguarding WHO's independence from any single member state or other party, an issue inextricably linked to funding. These recommendations

stem from concerns that political pressure might lead to undue delays in the declaration of a public health emergency.⁹ Many reports urged member states to provide WHO with more reliable, guaranteed money by increasing assessed contributions, which have been frozen in nominal terms (a decline in real terms) since the 1990s. Only a fifth of the organisation's budget is guaranteed. Donor funds, usually tied to donor priorities, comprise the remainder.

WHO has not initiated any major institutional reforms since the Ebola outbreak. At the 2015 World Health Assembly, governments did not support a proposal to increase assessed contributions by 5%, which would have raised the guaranteed budget only from around 20% to 21%. The matter was not substantively debated at the 2016 assembly, although it will be raised again in 2017. A few leading European and African member states supported increasing assessed contributions at the October 2016 WHO financing meeting, but most did not. Furthermore, no new transparency policy, organisation-wide accountability mechanism, or redefinition of core functions has taken place. Spearheading institutional reforms is likely to fall to the next director general.

UN and humanitarian systems

Many reports mentioned poor coordination between UN agencies, WHO, national governments, community leaders, and local and international non-governmental organisations and weak arrangements for accountability. Several of the reports suggested improving existing bodies, such as the Inter-Agency Standing Committee (IASC) and the Office for the Coordination of Humanitarian Affairs, rather than creating new ones, as was done for Ebola.³⁷ They also said that the profile of health crises should be raised across the UN.

The reports also highlighted the importance of accountability arrangements given the demanding nature of reforming complex organisations and systems. Their recommendations included an independent accountability commission,⁴ an annual report on global health security to the secretary general of the UN or the General Assembly,³ an independent review of implementation after two years,⁸ and a council on global public health crises in the General Assembly.⁷

In April 2016 the UN secretary general announced arrangements for WHO to inform his office of all grade 2-3 outbreaks and the IASC of outbreaks that may require a broader UN response. The secretary general also formed a global health crises task force to identify next steps, led by the heads of major UN agencies and the World Bank, with participation from independent experts and civil society.³⁸

However, no ongoing monitoring or accountability mechanism has yet been created. Identifying how to establish meaningful system-wide accountability will be a key challenge for the task force and new secretary general. Given that no member state representatives are on the task force, how to continue to engage national political leaders will also be important.

Conclusion

Ebola, and more recently Zika and yellow fever, have shown that the global system for preventing, detecting, and responding to disease outbreaks is not yet reliable or robust. The seven reports on the Ebola crisis largely agreed on the fundamental reasons behind our collective failure and the priorities for change. Substantial reforms are already under way and deserve support. But many problems remain, without dedicated political or financial resources. At the west African workshop on global

reforms after Ebola, ministerial representatives from Guinea, Liberia, Nigeria, Sierra Leone and the Economic Community of West African States also concluded that further reforms were urgently needed in west Africa and globally.³⁹

We have identified several priority gaps. Adequate, sustained financing and technical assistance must be mobilised to ensure that every country has the basic core capacities for identifying and responding to outbreaks. Unwarranted trade and travel restrictions need to be tackled. Many problems regarding health technologies are unresolved, including the need for international norms on sharing data and samples, standardised clinical trial protocols, clear regulatory processes, funding for research and development beyond vaccines, and measures to ensure equitable access to diagnostics, vaccines, and drugs for outbreaks. Finally, a core group of WHO member states must commit to tackling its deeper institutional weaknesses, such as unstable financing, unclear organisational focus, limited transparency, and vulnerability to political pressures from member states.

The reports concluded that the world remains grossly underprepared for outbreaks of infectious disease, which are likely to become more frequent in the coming decades. The window to launch major reforms opened immediately after the crisis, but may be closing as political attention wanes.

Determined leaders in Japan and Germany have kept outbreaks on the agenda of recent G7 and G20 summits, but other global crises continue to demand attention. Leadership changes in some of the most powerful countries, and at the head of WHO and the UN, have added considerable uncertainty about future global readiness for outbreaks.

Monitoring progress is therefore vital. A permanent and independent mechanism to hold governments and intergovernmental organisations accountable is sorely needed. The UN secretary general's global health task force has an important role in making arrangements for follow-up. The world will not be ready for the next outbreak without deeper and more comprehensive change.

Contributors and sources: All authors contributed to study concept, analysis, and interpretation, and provided critical revisions of the manuscript for important intellectual content. SM and AKJ supervised the study design and interpretation; SM oversaw data collection from the seven reports and progress to date on the recommendations within those reports, data analysis, data interpretation, drafting of the manuscript and revisions. JL and LW contributed to data collection, data analysis and data interpretation; as well as support in drafting the manuscript and responding to revisions. SM will act as the guarantor of the article. We thank Kim Eva Reimold for help in preparing the manuscript for submission, and peer reviewers Michael Edelstein and Charles C. Cliff for their insightful comments.

Competing interests: We have read and understood BMJ policy on declaration of interests and declare the following: SM was study director of the Harvard-LSHTM (London School of Hygiene and Tropical Medicine) Independent Panel on the Global Response to Ebola, which is discussed in this paper. FC has been awarded a grant by WHO to support their new emergencies programme in areas related to public health and was lead author of *WHO and emergency health: if not now, when*, which is discussed in this paper. PP has grants from the Bill and Melinda Gates Foundation outside of the submitted work and was chairman of the Harvard-LSHTM panel. GF was the director of the Paul G. Allen Ebola Program in 2014-15 but maintains no current affiliation; she was also a member of the advisory group on reform of WHO's work in outbreaks and emergencies, whose reports are discussed in this paper. L Gostin is director of the WHO Collaborating Centre on Public Health Law and Human Rights, as well as serving on both the

Key messages

- Seven reports on the global response to Ebola largely agree on what went wrong and what needs to be done
- Substantial efforts to tackle these problems are under way, but progress has been mixed
- Many critical problems have been given inadequate political or financial resources
- The global community needs to increase resources and implement monitoring and accountability mechanisms to ensure the world is better prepared for the next pandemic

Harvard-LSHTM panel and the National Academy of Medicine (NAM) Commission on a Global Health Risk Framework for the Future, which is discussed in this paper. DH was a member of the Harvard-LSHTM panel and developed a concept paper with WHO for an emergency response workforce and background papers for both the UN and the NAM panels. IK served as a member of the independent WHO Ebola Interim Assessment Panel, which is discussed in this paper and is a member of the secretary general's Global Health Crises Task Force. PS is chairman of the NAM Commission and chairman of the World Bank's International Working Group on Financing Preparedness, which is also mentioned in the paper. He is lead non-executive director of the Department of Health in England, none of these positions is paid. VD is chairman of the International Oversight Group for the NAM Commission. AJ and DS are co-chairs of the Harvard-LSHTM panel. MF, L Garrett, and SJM are panellists and JL and LW are staff on the Harvard-LSHTM panel. RK has nothing to declare.

Provenance and peer review: Not commissioned; externally peer reviewed.

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Tables

Table 1 | Reviewed reports into Ebola response

Publication date	Title	Convener (chair)	Scope and areas of emphasis
Commissioned by WHO			
July 2015	Ebola interim assessment panel	WHO (Barbara Stocking)	WHO's performance, focus on operational capacity, organisational culture, financing, communications, role in broader humanitarian systems
November 2015; January 2016	Advisory group on reform of WHO's work in outbreaks and emergencies	WHO director general (David Nabarro)	WHO core mandate and critical functions, focus on reform of WHO's work in outbreaks and emergencies
May 2016	Report of the review committee on the role of the IHR(2005) in the Ebola outbreak and response	WHO director general (Didier Houssin)	Recommendations for improved implementation of IHR, based on assessment of their effectiveness in Ebola outbreak and the status of implementation of recommendations from the previous review committee
Commissioned by others			
November 2015	Will Ebola change the game? Ten essential reforms for the next pandemic	Harvard / LSHTM (Peter Piot)	Global system performance, with focus on IHR compliance, knowledge management, R&D, governance of global system, WHO reform
January 2016	The neglected dimension of global security: a framework to counter infectious disease crises	US National Academy of Medicine (Peter Sands)	Recommendations for the future based on review of past outbreak emergencies, with focus on the economic case for investing pandemic preparedness, national core capacities, WHO operational capacity, and R&D
January 2016	World Health Organization and emergency health: if not now, when?	Lead author: Francesco Checchi	Recommendations for WHO, based on review of past responses to health emergencies, with a focus on six stand out problems
January 2016 (panel report); April 2016 (UN secretary general's commentary)	Protecting humanity from future health crises: report of the high-level panel on the global response to health crises	UN secretary general (Jakaya Kikwete)	Recommendations to strengthen national and international systems to prevent and effectively respond to future health crises, with a focus on national health systems, WHO and UN systems, development aid, R&D, financing, UN follow-up

IHR=International Health Regulations; LSHTM=London School of Hygiene and Tropical Medicine

Table 2| Breakdown of reports by topic, with key areas of agreement.

Topic	Areas of agreement
Compliance with IHR	
National health systems and core capacities	Need to develop national core capacities and for domestic and external financing. Need more credible assessment of country core capacities, including proposals for independent, external, and peer assessments. WHO technical support to countries needed
Trade and travel restrictions	Need incentives for early reporting of outbreaks and stronger disincentives or compliance mechanisms for undue trade and travel restrictions, for both governments and private sector
Knowledge management	
Sharing epidemiological and research data	Need for systems for rapid sharing of epidemiological and other research data. Platforms for sharing strategies for community mobilisation and communications
R&D of health technologies	Need global R&D funding for emerging infectious diseases. Need WHO to convene, set priorities, and coordinate pandemic related R&D. Need to directly ensure that affected populations have access to relevant health technologies. Expansion of PIP Framework to other pathogens. Need agreed research standards and processes for regulatory approval. Need to build local research capacity and engage local researchers and communities.
UN and humanitarian emergency systems	
Operational	Need better capacity for health and humanitarian actors to work together in crises and to strengthen capacity of existing institutions rather than create new ones
Political	Need to systematically bring health matters before broader UN governing bodies (either UN General Assembly or Security Council)
Readiness and reform of WHO	
PHEIC declaration	Use intermediate alert before public health emergencies. Measures for greater transparency and independence of declaring an emergency
Emergency capacity and culture	Creation of dedicated WHO centre with proposals for a separate oversight body (whether governing, technical, advisory, or independent board). Need to develop operational emergency culture and to strengthen ability to work with non-state bodies
Human resources	Consolidation of emergency related units in WHO. Creation of virtual global health emergency workforce under WHO. Need for strengthened capacity of WHO staff at country and regional offices, with objective performance management and merit based, competitive appointments
Governance and leadership	Need for strong leadership, particularly electing a director general able to challenge or hold accountable member states. More streamlined relations between headquarters, regional, and country offices in emergencies, including central role of headquarters if countries have inadequate capacity. Little discussion of the organisation's core functions
Financing	Need to improve predictability of financing. Several calls for increasing assessed contributions (by 5-10%) and funding emergency work with core budget
Follow-up and accountability	
Financing	Need better transparency and harmonisation of international aid flows. WHO contingency fund. Global R&D pandemic financing ≥\$1bn a year. World Bank PEF and other rapidly disbursed funding sources for emergencies. National health system strengthening financing.
Accountability	Need for ongoing mechanisms for monitoring and accountability for preparedness and response efforts.

PHEIC=public health emergency of international concern; R&D=research and development; PIP=pandemic influenza preparedness; PEF=Pandemic Emergency Financing Facility

Table 3| Countries externally evaluated by WHO member states (P A Sands, O Kuivasiemi, personal communication, 2016)

	Completed	Scheduled for 2017	Not scheduled	No (%) of income group completed or scheduled (n=194)
Low income countries	Afghanistan, Eritrea, Ethiopia, Liberia, Mozambique, Senegal, Sierra Leone, Somalia, Tanzania, Uganda	-	Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, DPRK, DRC, Gambia, Guinea, Guinea-Bissau, Haiti, Madagascar, Malawi, Mali, Nepal, Niger, Rwanda, South Sudan, Togo, Zimbabwe	10/31 (32)
Lower middle income countries	Armenia, Bangladesh, Cambodia, Cote d'Ivoire, Kyrgyz Republic, Morocco, Pakistan, Sudan, Tunisia, Ukraine, Vietnam	Cameroon, Djibouti, Ghana, Kenya, Kiribati, Lao PDR, Micronesia, Mongolia, Philippines, Samoa, Solomon Islands, Tonga, Vanuatu	Bhutan, Bolivia, Cape Verde, Rep of Congo, Egypt, El Salvador, Guatemala, Honduras, India, Indonesia, Lesotho, Mauritania, Moldova, Myanmar, Nicaragua, Nigeria, Papua New Guinea, Sao Tome and Principe, Sri Lanka, Swaziland, Syria, Tajikistan, Timor-Leste, Uzbekistan, Yemen, Zambia	23/50 (48)
Upper middle income	Albania, Belize, Georgia, Jordan, Lebanon, Namibia, Peru, Turkmenistan	Fiji, Iran, Malaysia, Maldives, Marshall Islands, Palau, Tuvalu	Algeria, Angola, Argentina, Azerbaijan, Belarus, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, China, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, Equatorial Guinea, Gabon, Grenada, Guyana, Iraq, Jamaica, Kazakhstan, Libya, Macedonia, Mauritius, Mexico, Montenegro, Panama, Paraguay, Romania, Russian Federation, St Lucia, St Vincent and the Grenadines, Serbia, South Africa, Suriname, Thailand, Turkey, Venezuela	15/55 (27)
High income	Bahrain, Portugal, Qatar, United Kingdom, USA	Finland, Italy, Japan, Rep Korea, Kuwait, Nauru, Oman, Saudi Arabia, Singapore, Switzerland, UAE	Andorra, Antigua and Barbuda, Australia, Austria, Bahamas, Barbados, Belgium, Brunei Darussalam, Canada, Chile, Croatia, Cyprus, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Latvia, Lithuania, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Poland, Saint Kitts and Nevis, San Marino, Seychelles, Slovakia, Slovenia, Spain, Sweden, Trinidad and Tobago, Uruguay	16/56 (29)
Not classified			Cook Islands, Niue	0/2 (0)
Total				64/194 (34)