

CURRENT TRENDS IN GLOBAL BIOSECURITY AND BIOSAFETY

An Analysis and Recommendations for the NTI Global Biosecurity Dialogue

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This paper provides a snapshot of national biosecurity capabilities and provides recommendations for consideration during the upcoming Global Biosecurity Dialogue for accelerating collective action and urgently contribute to strategies on closing gaps in global health security.

The purpose of the Global Biosecurity Dialogue is to:

- Explore practical approaches to achieve and track new, concrete biosecurity activities to advance international biosecurity, particularly within the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (Global Partnership) and the Global Health Security Agenda (GHSA);
- Raise threat awareness about biological risks among high-level policymakers, including within foreign affairs and defense ministries;
- Identify and overcome barriers to strengthening biosecurity globally; and
- Provide a forum for an integrated and creative dialogue among government officials, experts, civil society, and other stakeholders.

INTRODUCTION

Infectious diseases do not respect borders and historically have presented a considerable threat to mankind. Biological threats¹ – whether naturally occurring, deliberate, or accidental – have the potential to kill millions, cost billions, and exacerbate political instability^{2,3}. Over the past decade, the risk of a catastrophic biological event has increased and will continue to be magnified by global travel and trade, urbanization, terrorist interest in weapons of mass destruction, and rapid advances in technology that can create and manipulate pathogens with pandemic potential. While the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (Global Partnership) and the Global Health Security Agenda (GHSA) have both emphasized the need for countries to improve biosecurity capability, 69% of assessed countries still do not have adequate capability in place. In addition, mechanisms for collective financing for biosecurity assistance among donors and host governments have proven difficult. Biosafety⁴ has long been considered a critical element of the World Health Organization (WHO) International Health Regulations (IHR); however, the concept of biosecurity⁵ has historically not been as closely considered. In recent years, biosecurity has gained global attention due to increasing concerns about deliberate biological events and emerging biological risks associated with advances in technology, which could simplify the deliberate or accidental development, delivery, or release of biological agents. Further, the increasing use of chemical weapons has raised concerns about the potential for future use of biological agents by terrorists or state actors⁶.

The Global Biosecurity Dialogue seeks to elicit new, concrete actions to improve national, regional, and global biosecurity and to identify and overcome barriers to achieving that goal.

¹ Banga, Prerna, and Siddharth Soni. “Assessing the Risk of Proliferation of Chemical and Biological Weapons into Terrorist Groups.” Accessed May 31, 2018.

<https://www.symlaw.edu.in/files/Background%20Guide-Committee%20on%20Disarmament%20and%20International%20Security.pdf>.

² “OIE Global Conference on Biological Threat Reduction: OIE - World Organisation for Animal Health.” Simulation Exercise: Biological Terrorism Threat - Foot and Mouth Disease in Spain : OIE - World Organisation for Animal Health. Accessed May 31, 2018. <http://www.oie.int/for-the-media/press-releases/detail/article/oie-global-conference-on-biological-threat-reduction/>

³ “Introduction.” Simulation Exercise: Biological Terrorism Threat - Foot and Mouth Disease in Spain : OIE - World Organisation for Animal Health. Accessed May 31, 2018.

<http://www.oie.int/eng/BIOTHREAT2017/introduction.htm>

⁴ Biosafety is “...the containment principles, technologies and practices that are implemented to prevent the unintentional exposure to pathogens and toxins, or their accidental release.” World Health Organization. (2016). Joint external evaluation tool: International Health Regulations (2005). World Health Organization. <http://www.who.int/iris/handle/10665/204368>

⁵ Biosecurity is “...the protection, control and accountability for valuable biological materials within laboratories as well as information related to these materials and dual-use research, in order to prevent their unauthorized access, loss, theft, misuse, diversion or intentional release.” World Health Organization. (2016). Joint external evaluation tool: International Health Regulations (2005). World Health Organization. <http://www.who.int/iris/handle/10665/204368>

⁶ Schmitt, Ketra, and Nicholas A. Zacchia. “Total Decontamination Cost of the Anthrax Letter Attacks.” Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science 10, no. 1 (2012): 98-107. doi:10.1089/bsp.2010.0053.

<https://pdfs.semanticscholar.org/16fe/ca9d8ec07e34bf146153e8052b28c2d5d0e2.pdf>

GLOBAL BIOLOGICAL RISKS WITH CATASTROPHIC POTENTIAL ARE INCREASING

This year marks the 100th anniversary of the 1918 influenza pandemic, which has estimated to have killed over 50 million people globally (or 3-5% of the human population) from 1918-1920. This is four times more than combat related deaths during the First World War from 1914-1918. Although knowledge about the mechanisms of spread for infectious diseases has increased during the past century, as well as the level of hygiene and health care, the world has also changed dramatically.

For example, while rapid advances in biotechnology hold great societal promise, global and democratizing trends in travel, trade, and technology are increasing the risk of a deliberate or accidental high consequence biological event. Advances in technology, cheaper DNA synthesis, and widespread access to gene editing tools have made it possible for a wider array of actors to manipulate biological agents and systems. A recent pandemic exercise from the Johns Hopkins Center for Health Security, which modeled a bioterrorism event with a moderately lethal genetically modified pathogen, ended with global spread and 150 million dead⁷.

In addition, the world population is almost five times as large in 2018 as it was in 1900, and in 55% of the world population now resides in urban areas⁸. This is a significant increase even from 1960, when, after the industrial revolution, only a third of the population lived in urban areas.

Biological events can also have significant financial consequences. Decontamination costs following the anthrax letter attacks in 2001 were estimated by Schmitt and Zacchia to have been \$320 million⁹. The SARS outbreak between November 2002 and July 2003 killed almost 10% of the more than 8,000 people infected and cost the world economy an estimated \$54 billion¹⁰. The 2007 Foot-and-Mouth Disease (FMD) outbreak in United Kingdom caused by inadvertent release of FMD virus from an OIE World Reference Laboratory cost \$200 million^{11,12}.

⁷ Cizek, Julia. "Clade X | A Pandemic Exercise." Variola Virus (Smallpox). May 25, 2018. Accessed June 06, 2018. http://www.centerforhealthsecurity.org/our-work/events/2018_clade_x_exercise/

⁸ "Flu Outbreaks Reminder of Pandemic Threat." World Bank. Accessed May 31, 2018. <http://www.worldbank.org/en/news/feature/2013/03/05/flu-outbreaks-reminder-of-pandemic-threat>

⁹ Schmitt, Ketra, and Nicholas A. Zacchia. "Total Decontamination Cost of the Anthrax Letter Attacks." Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science 10, no. 1 (2012): 98-107. doi:10.1089/bsp.2010.0053. <https://pdfs.semanticscholar.org/16fe/ca9d8ec07e34bf146153e8052b28c2d5d0e2.pdf>

¹⁰ "Flu Outbreaks Reminder of Pandemic Threat." World Bank. Accessed June 02, 2018. <http://www.worldbank.org/en/news/feature/2013/03/05/flu-outbreaks-reminder-of-pandemic-threat>

¹¹ Rhodes, Catherine. "Consequences of Failure to Apply International Standards for Laboratory Biosafety and Biosecurity: The 2007 Foot-and-Mouth Disease Outbreak in the UK." Applied Biosafety 14, no. 3 (2009): 144-49. doi:10.1177/153567600901400306. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.226.3259&rep=rep1&type=pdf>

¹² "AT WHAT COST? 2001 AND 2007 FOOT AND MOUTH DISEASE OUTBREAK UNITED KINGDOM." Food Safety, Dairy: Oklahoma Department of Agriculture, Food and Forestry. Accessed May 31, 2018. <https://www.oda.state.ok.us/ais/atwhatcost.pdf>

The recent Ebola outbreak in West-Africa killed over 11,000 people and had consequences far beyond countries' health systems, including political and socioeconomic ramifications. The outbreak also showed the importance of implementing infection prevention standards to improve patient and health workers safety^{13,14}. According to World Bank statistics Guinea, Liberia, and Sierra Leone lost \$2.2 billion in forgone economic growth in 2015 because of the epidemic¹⁵.

COUNTRIES LACK ADEQUATE BIOSECURITY CAPABILITY

Despite growing risks, most countries still do not have in place the required capabilities to prevent, detect, and respond to high consequence biological events, including biosecurity capability. As of May 15, 2018, 75 countries have completed Joint External Evaluations (JEE). In total, 48 indicators from 19 technical areas have now been assessed for each of the 62 countries that have published their report on WHO's website. Countries' average results show that 43% of the total number of all indicators that were assessed showed limited or no broad-based health security capability¹⁶, and very low capability is observed for specific indicators focused on biosecurity, biosafety, and the ability to link public health with security authorities. The three following figures were prepared using data provided by JEE Mission Reports published on the WHO Strategic Partnership Portal website^{17,18}.

¹³ Mullan, Z. The cost of Ebola. *The Lancet Global Health*, 3(8), e423. 2015.

<https://www.thelancet.com/pdfs/journals/langlo/PIIS2214-109X%2815%2900092-3.pdf>

¹⁴ Kraemer, John D., and Mark J. Siedner. "The Effect of Ebola Virus Disease on Health Outcomes and Systems in Guinea, Liberia, and Sierra Leone." *Global Management of Infectious Disease After Ebola*, 2016, 55-74. doi:10.1093/acprof:oso/9780190604882.003.0003.

¹⁵ "World Bank Group Ebola Response Fact Sheet." World Bank. Accessed May 31, 2018.

<http://www.worldbank.org/en/topic/health/brief/world-bank-group-ebola-fact-sheet>

¹⁶ Gozzer, E. Personal communication, May 9, 2018.

¹⁷ "Joint External Evaluation (JEE) Mission Reports." World Health Organization. February 09, 2018. Accessed June 06, 2018. <http://www.who.int/ihr/procedures/mission-reports/en/>

¹⁸ "Strategic Partnership for International Health Regulations (2005) and Health Security (SPH)." World Health Organization. Accessed June 06, 2018. <https://extranet.who.int/sph/>

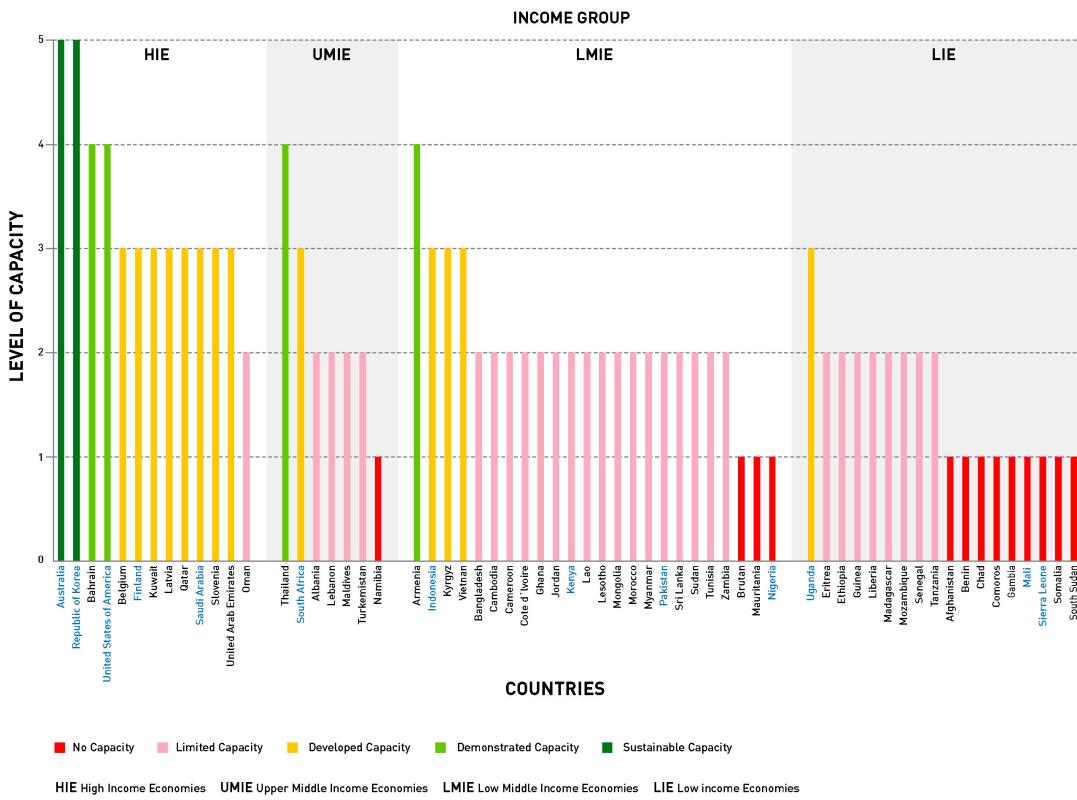


Figure 1. Level of capacity in the indicator “whole-of-government biosafety and biosecurity system for human, animal, and agricultural facilities”, among the 62 countries that have published JEE Reports (May 2018). Countries are listed according to World Bank’s income group classification.

When focusing on biosecurity and biosafety related indicators, as shown in Figure 1, only two countries (3%) show *sustainable level of capacity* for having in place a whole-of-government biosafety and biosecurity system, and only 17 countries (27%) show *developed or demonstrated level of capacity*. The remaining 43 countries (70%) show *no or limited capacity* and belong to Upper Middle-Income Economies (UMIE), Low Income Economies (LIE) and Low Middle Income Economies (LMIE) countries. Most countries show their biosafety and biosecurity systems are still in development which poses important challenges to face public health threats.

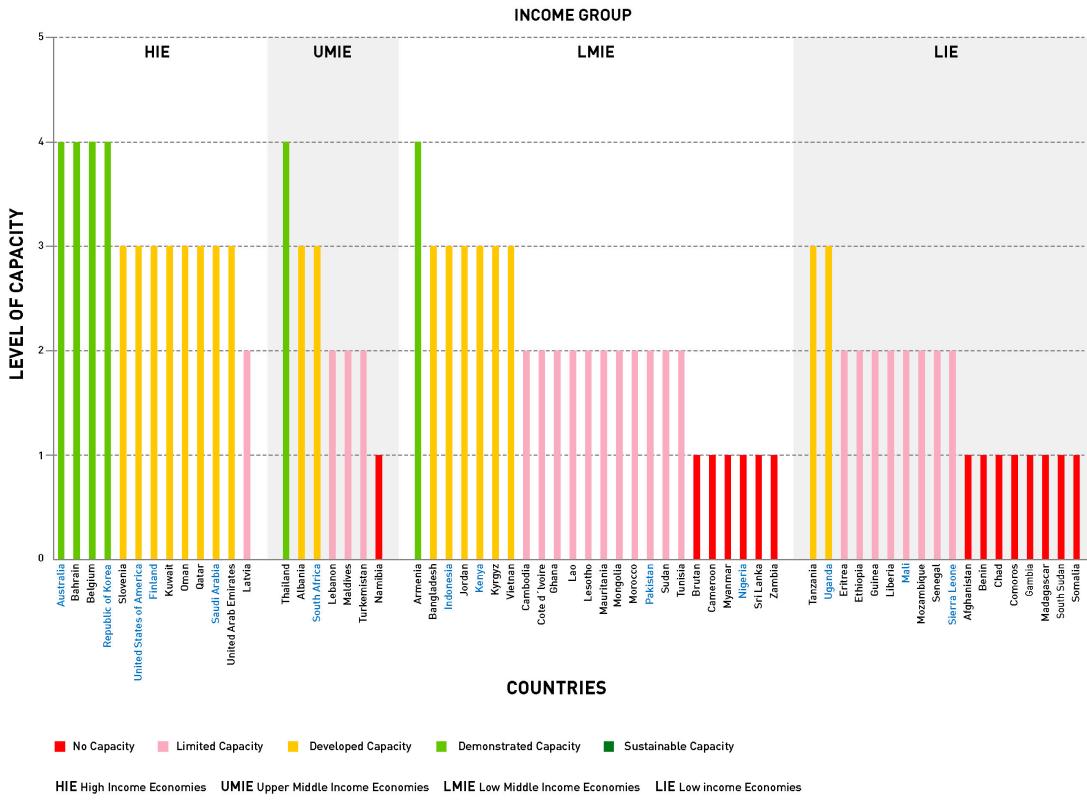


Figure 2. Level of capacity in biosafety and biosecurity training and practices among the 62 countries that have published JEE Reports (May 2018). Countries are listed according to World Bank's income group classification.

Similarly, when focusing on biosecurity and biosafety training capacity, no country showed *sustainable level of capacity*, 24 countries (39%) showed *developed or demonstrated level of capacity* and 38 countries (61%) showed *limited or no capacity* (Figure 2.). Human resources training in biosafety and biosecurity seem to be in their early stages as most countries show very low scores. Therefore, urgent measures are needed to support and enhance training. Country-to-country and international cooperation of frontline workers could be useful strategies to face this challenge.

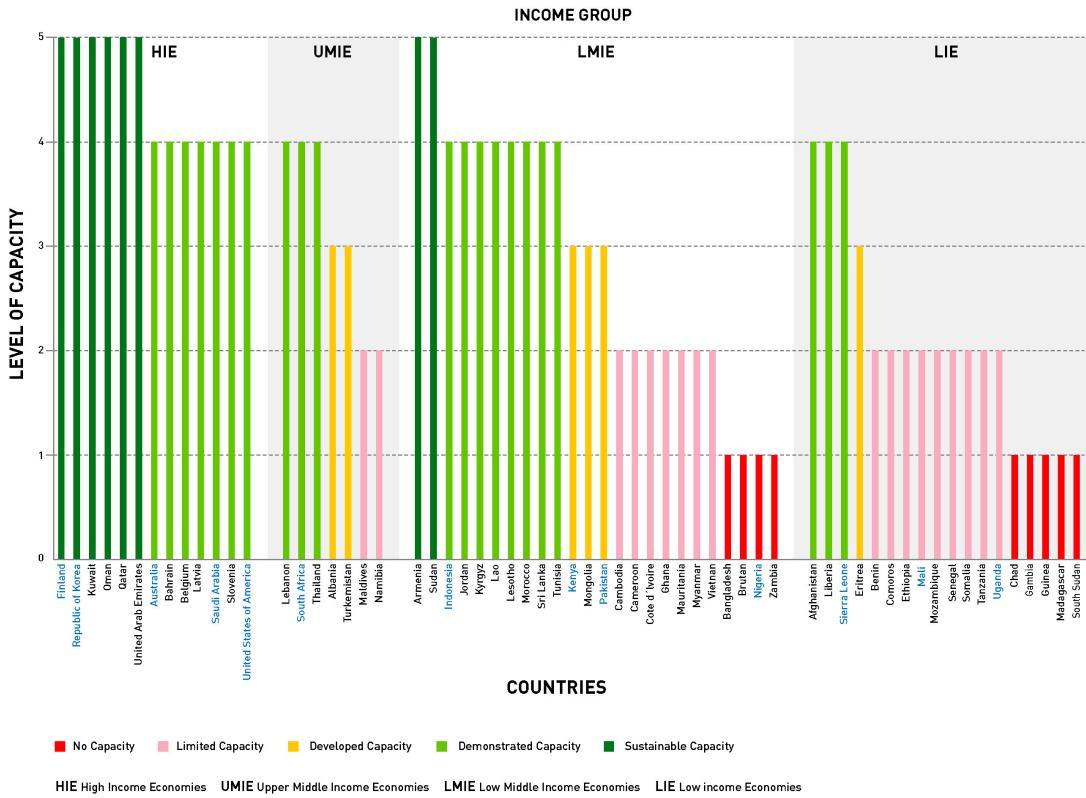


Figure 3. Level of capacity in country capacity to link public health and security authorities among countries that published its JEE Report organized by income group. May 2018. Countries are listed according to World Bank's income group classification.

The results for the JEE indicator that measures capacity to link public health and security authorities (Figure 3.), are more encouraging than for the other indicators for Biosafety and Biosecurity presented above (Figures 1. and 2.). There are eight countries (13%) with *sustainable level of capacity*, and 27 countries (43.5%) show *developed or demonstrated level of capacity*, while 27 countries (43.5 %) showed *no or limited capacity*.

The level of capacities for the 13 countries that have completed and published their JEE as of May 2018 and are attending the first NTI Global Biosecurity Dialogue Meeting (June 18-20th, 2018) are summarized in Figures 4-7. Even though this not a representative sample, results show similar patterns as those seen for all 62 countries with publicly available data (Figures 1-3).

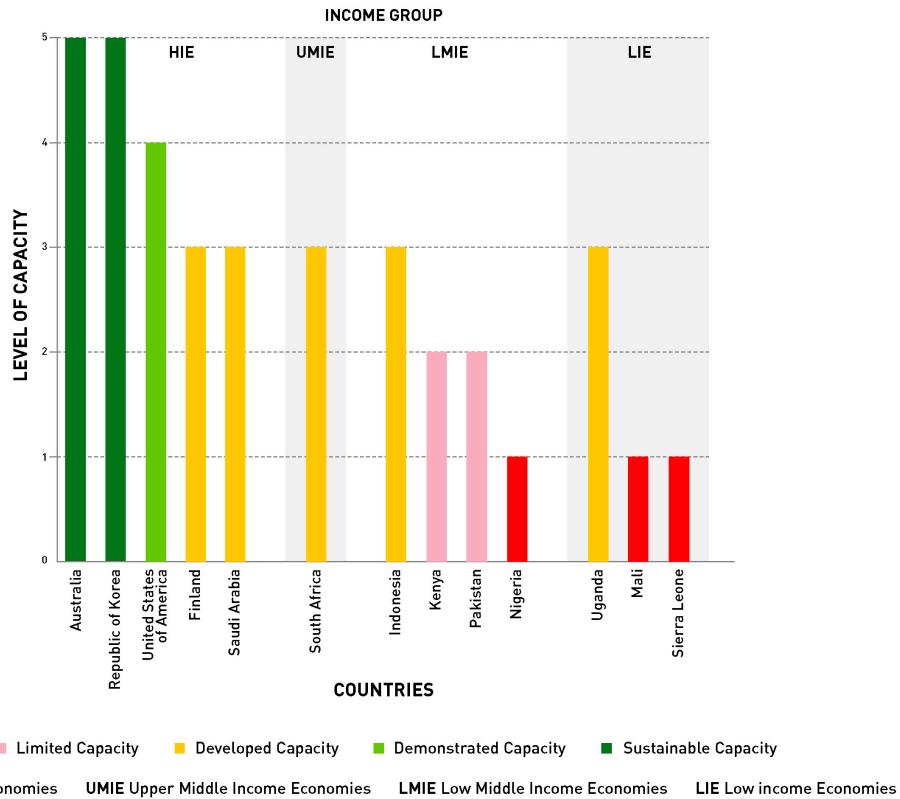


Figure 4. Level of capacity in the indicator “whole-of-government biosafety and biosecurity system is in place for human, animal, and agriculture facilities”. A summary of results for countries attending the NTI Global Biosecurity Dialogue Meeting (June 18-20th, 2018).

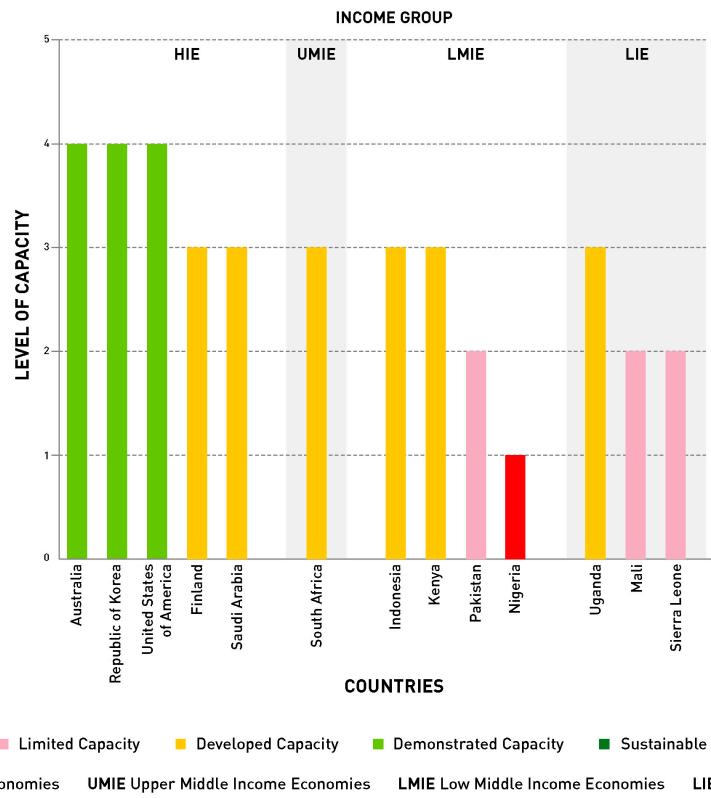


Figure 5. Level of capacity in the indicator “biosafety and biosecurity training and practices”. A summary of results for countries attending the NTI Global Biosecurity Dialogue Meeting (June 18-20th, 2018).

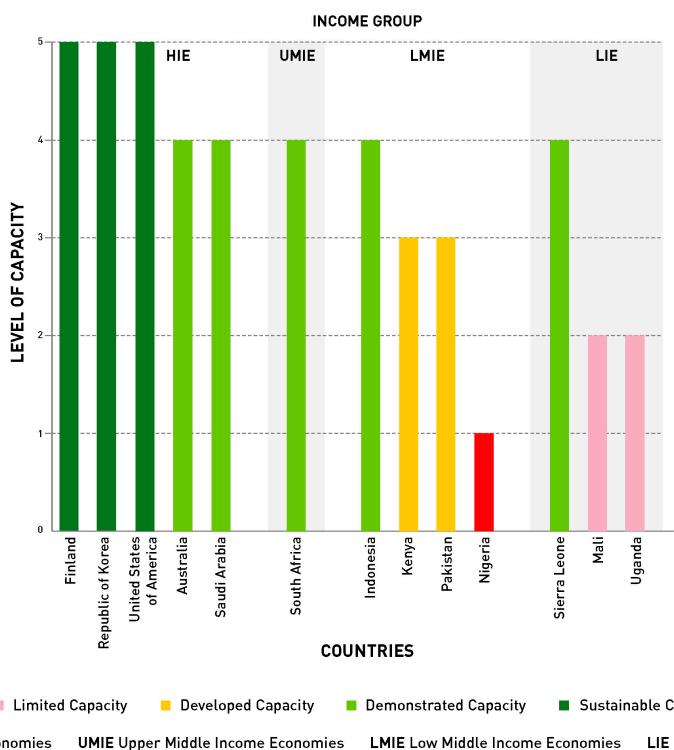


Figure 6. Level of capacity in indicator “linking public health and security authorities”. A summary of results for countries attending the NTI Global Biosecurity Dialogue Meeting (June 18-20th, 2018).

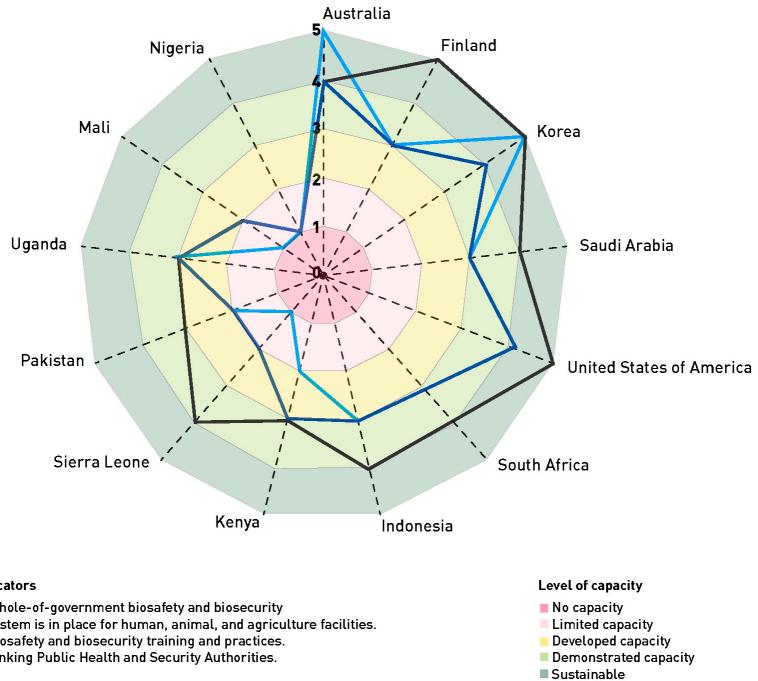


Figure 7. A combined summary on the level of capacity in three indicators related to biosafety, biosecurity, and linking Public Health and Security Authorities. Results shown for countries attending the NTI Global Biosecurity Dialogue Meeting (June 18-20th, 2018).

Trends for biosecurity and biosafety vary according the level of capacity of the country. Those countries that score low tend to have outdated regulations and lack a national list of especially dangerous pathogens or a consolidation of such pathogens into a minimal number of facilities. Those that do have an official list of dangerous pathogens usually lack mechanisms for monitoring and periodically updating the inventory. In many of these countries, some level of personnel training exists; however, there is usually no national curricula underpinning the training. Many of these countries are planning or are in the process of developing or updating specific legislation, though implementation will depend on prioritization and financing. Among countries that score high for each of the JEE indicators discussed above, regulations or legislation are often in place, although some countries are in the process of updating them. Most of these countries have an official list of especially dangerous pathogens and a safe, minimal number of storage places, and in many of them third-party assessments are performed regularly.

Institutional weakness, lack of awareness and political commitment for improvement seem to be among the main challenges for countries that score low on the JEE for biosecurity capacity. In addition, there is a deficiency of global financing available to close the biosecurity gaps found by JEE reports. In fact, a recent analysis found that only a very small number of donors are responsible for 94% of reported biosecurity-targeted assistance¹⁹.

¹⁹ “WHO Data Demonstrates Weaknesses in Biosecurity and Biosafety Systems Worldwide.” Nuclear Threat Initiative - Ten Years of Building a Safer World. Accessed May 31, 2018.

Many countries have an urgent need for developing or updating technical guidelines for use, inventory, storage and elimination of dangerous pathogens as well as for the management of biological incidents and accidents. Furthermore, emerging biological risks associated with advances in technology are not yet well-considered by the JEE tool. Therefore, the organizers of the NTI Global Biosecurity Dialogue meeting will address this issue by providing participants with additional questions for country consideration that relate to oversight of life sciences dual use research (Attachment III).

To close the identified major biosecurity capability gaps outlined in Figures 1-3, and to address the described challenges, technical and financial assistance providers (e.g. Global Partnership members, the WHO, OIE, FAO, philanthropies, and international aid organizations) should collaborate with countries to develop, publish, finance and otherwise support countries to implement national action plans for health security that contain clear, costed, realistic, and sustainable funding priorities for biosecurity.

URGENT NEED TO IMPROVE GLOBAL BIOSECURITY

Biosecurity remains an under-represented area in global initiatives that focus on building health security capacities and only a small number of global donors are providing support to assist countries in need. However, the development of common indicators and targets for monitoring and evaluating national biosecurity capability are a breakthrough that can now allow for collective action and financing to fill urgent gaps. These targets are included in the World Health Organization's JEE tool sections on biosecurity and biosafety and linking public health and security authorities are located at Attachment II. These have been adapted by the organizers of the Global Biosecurity Dialogue into a series of yes/no questions, located in Attachment III.

Now that common tools and targets exist for measuring improvements in national biosecurity capability, improvement will require an international effort to recognize external evaluations, assist countries to develop the biosecurity-relevant portions of their national action plans, and fill urgent gaps. Expertise and financing will be necessary to implement identified priority actions, and these actions should be tracked on an annual basis. The ideal resulting iterative, sustained cycle is outlined below (Figure 4)^{1,20}.

<http://www.nti.org/analysis/articles/who-data-demonstrates-weaknesses-biosecurity-and-biosafety-systems-worldwide/>

²⁰ Bell, E., J. W. Tappero, K. Ijaz, M. Bartee, J. Fernandez, H. Burris, K. Sliter, S. Nikkari, S. Chungong, G. Rodier, H. Jafari, and S. E. CDC. "Joint External Evaluation-Development and Scale-Up of Global Multisectoral Health Capacity Evaluation Process." *Advances in Pediatrics*. December 2017. Accessed May 31, 2018. <https://www.ncbi.nlm.nih.gov/pubmed/29155678>

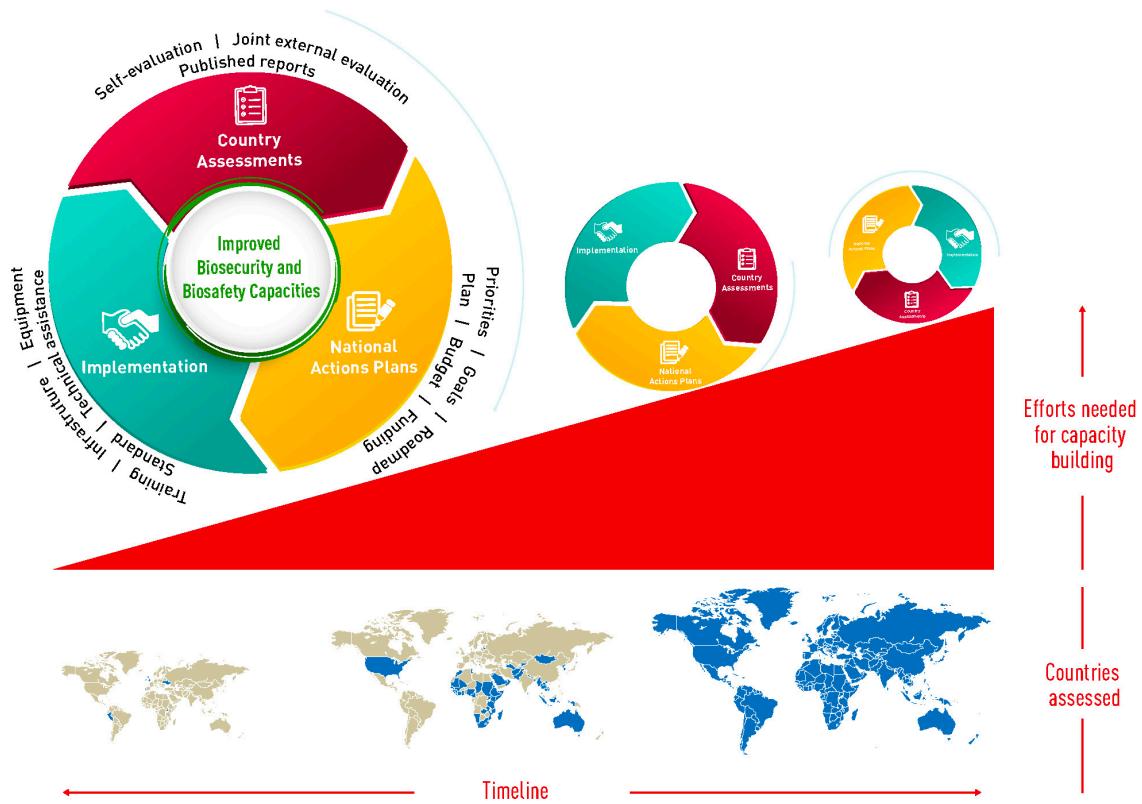


Figure 8. Political commitment and whole-of-government approaches are required to strengthen global biosecurity. Repeated Country assessments (in 3-5 year intervals) in voluntary countries followed by National action planning and implementation will strengthen national capacities for biosecurity. Ideally, in the near future, gaps are identified and filled in all countries for universal coverage. (Modified from Joint External Evaluation: Team Lead Training. November 2016.)

In 2015, the GHSA tool and process were used to assess six countries in eleven areas of Action relevant to Health security. From 2016 to May 2018, 76 countries have completed their JEE to assess 19 Technical Areas and 62 of the countries have published the respective Mission Reports. Currently, there are 21 countries in the pipeline for JEE, 26 have completed their national action plan of health security and 17 are developing their plans. This situation is shown in Figure 8. The last world map represents the ideal situation in the future.

In Figure 8, the level of effort to develop political commitment is greater at the beginning of the process because existing biosecurity capacities are low. Gradually, over time more and more countries develop and adopt national action plans for health security, which are then implemented, resulting in improved capability. That includes strengthening biosecurity, biosafety, and the link between public health and security authorities.

CONCLUSIONS AND RECOMMENDATIONS

The risk of a high consequence biological event is increasing, and there are major gaps in the development of national systems of biosecurity and biosafety, especially in Low Income Economies and Low Middle Income Economies as compared with High Income Economies and Upper Middle Income Economies. Gaps also exist, though less deep, for country capacity to conduct a rapid, multisectoral response that links public health and security authorities during a crisis.

To fill the identified major biosecurity capability gaps and to face the identified challenges we recommend the following actions (see below) for consideration by the NTI Global Biosecurity Dialogue and its members when they meet from June 18-20th, 2018 in London.

SPECIFIC RECOMMENDED ACTIONS

The Global Biosecurity Dialogue should develop practical next steps toward achieving each of these four recommendations. Progress should be announced by the Action Package on Biosafety and Biosecurity during the Global Health Security Agenda Ministerial in Bali in November 2018 and by the Canadian G-7 presidency during the fall meeting of the Global Partnership Working Group.

- 1. Countries should identify and prioritize biosecurity and biosafety-related milestones within their national action plans for health security.**
 - These actions, and the barriers toward achieving them – as outlined by the countries gathered for the Global Biosecurity Dialogue – should be annually reviewed and tracked.
 - A specific set of milestones, driven by yes/no questions, can be used as an additional tool to determine progress in biosecurity.
- 2. Regional and international organizations should develop specific incentives for countries to prepare and attain annual biosecurity goals.**
 - These should be annually reviewed and tracked.
- 3. Countries that undergo an independent assessment and create a plan of specific milestones for biosecurity should be supported.**
 - The Global Partnership and other assistance providers could consider: 1) Highlighting these countries on a rolling basis in annual meetings; and 2) Supporting the countries that have conducted such assessments and have developed a national action plan that includes specific actions for biosecurity and biosafety.
- 4. The Global Biosecurity Dialogue, in collaboration with GHSA Action Package Prevent-3 and the Global Partnership Working Group, should identify and further develop concrete mechanisms to assist countries seeking to improve national capacities for biosecurity and biosafety.**
 - Tools should be produced that can support concrete action at the country level.

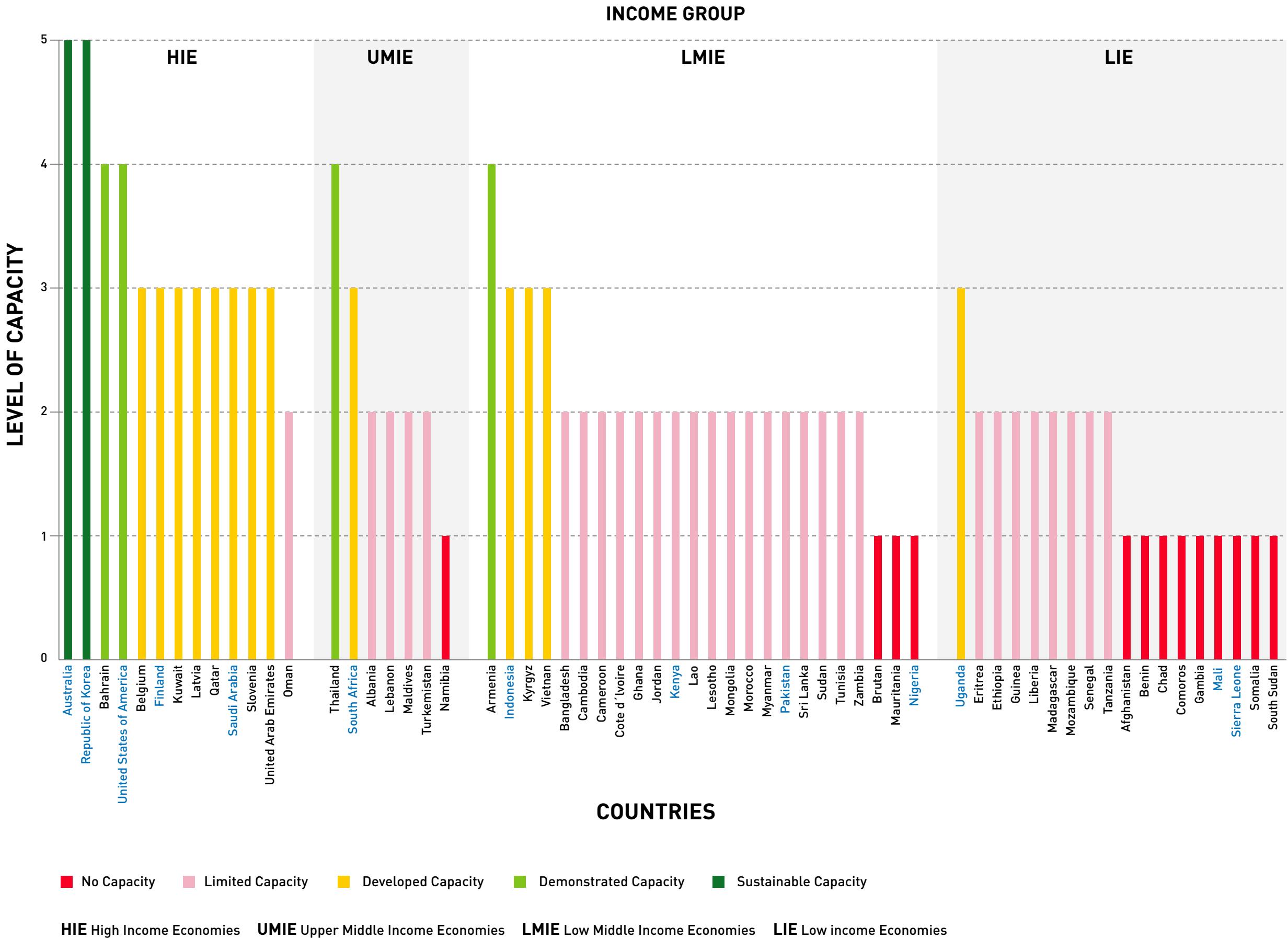


Figure 1. Level of capacity in the indicator “whole-of-government biosafety and biosecurity system for human, animal, and agricultural facilities”, among the 62 countries that have published JEE Reports (May 2018). Countries are listed according to World Bank’s income group classification.

INCOME GROUP

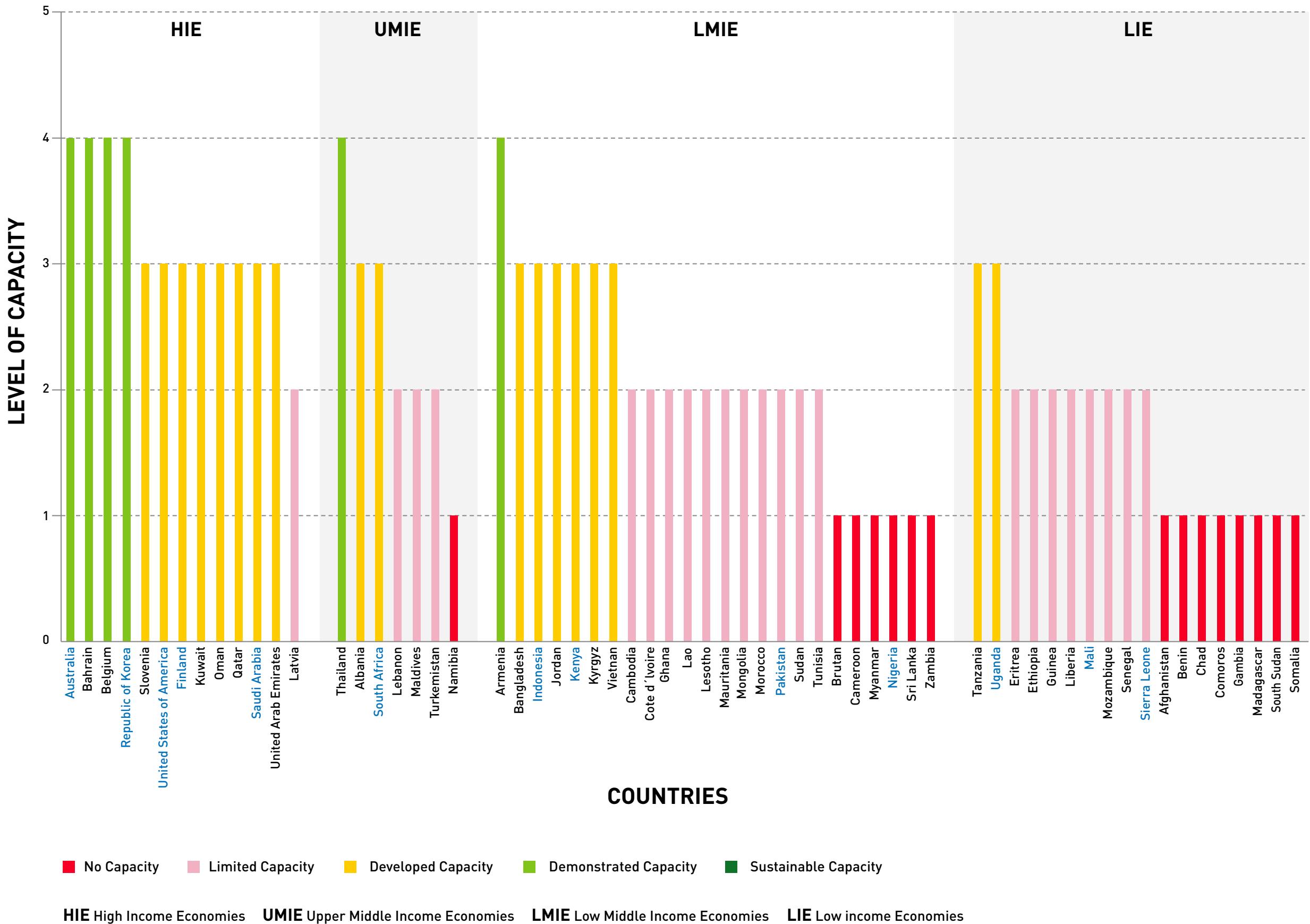


Figure 2. Level of capacity in biosafety and biosecurity training and practices among the 62 countries that have published JEE Reports (May 2018). Countries are listed according to World Bank's income group classification.

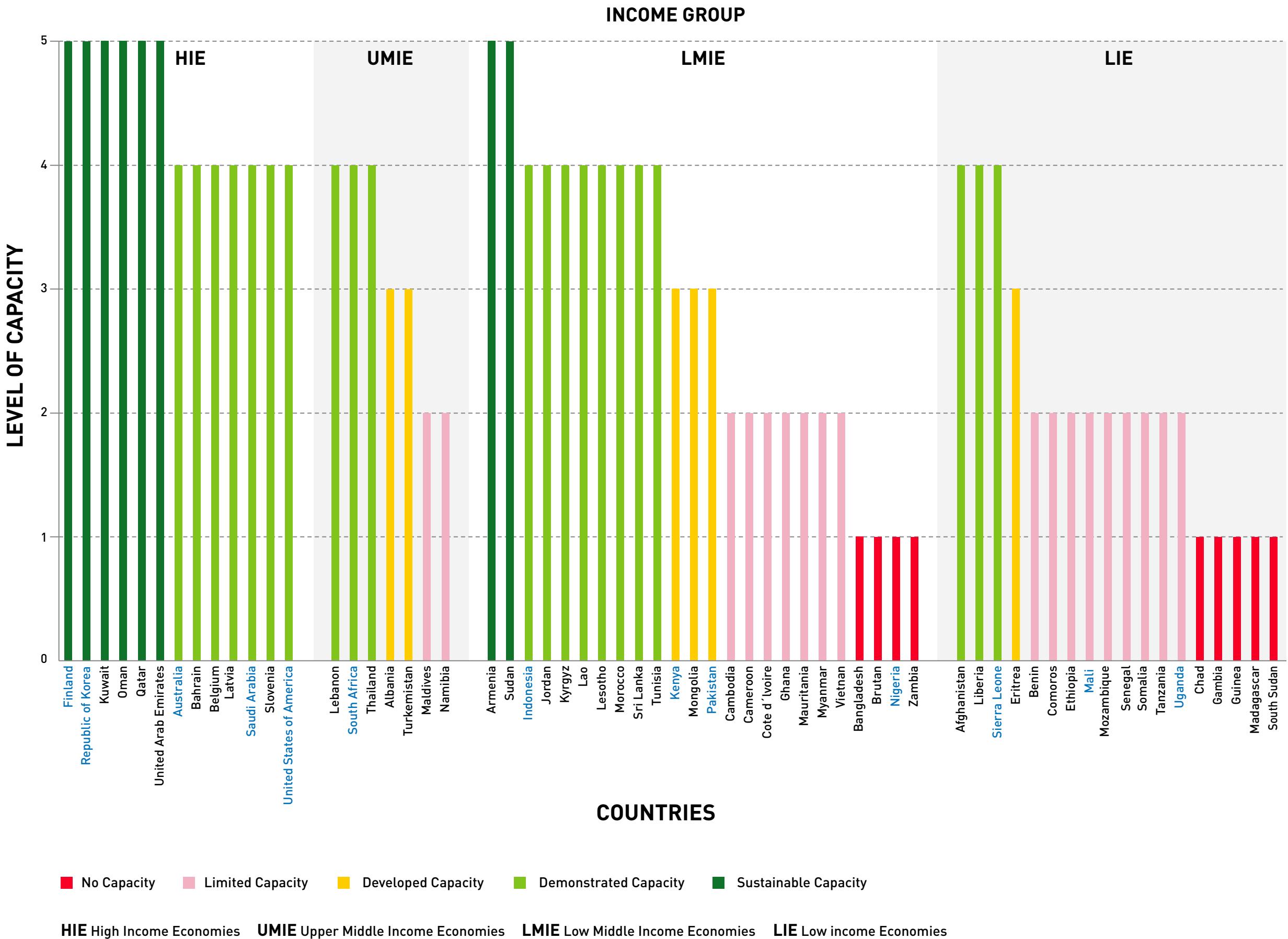


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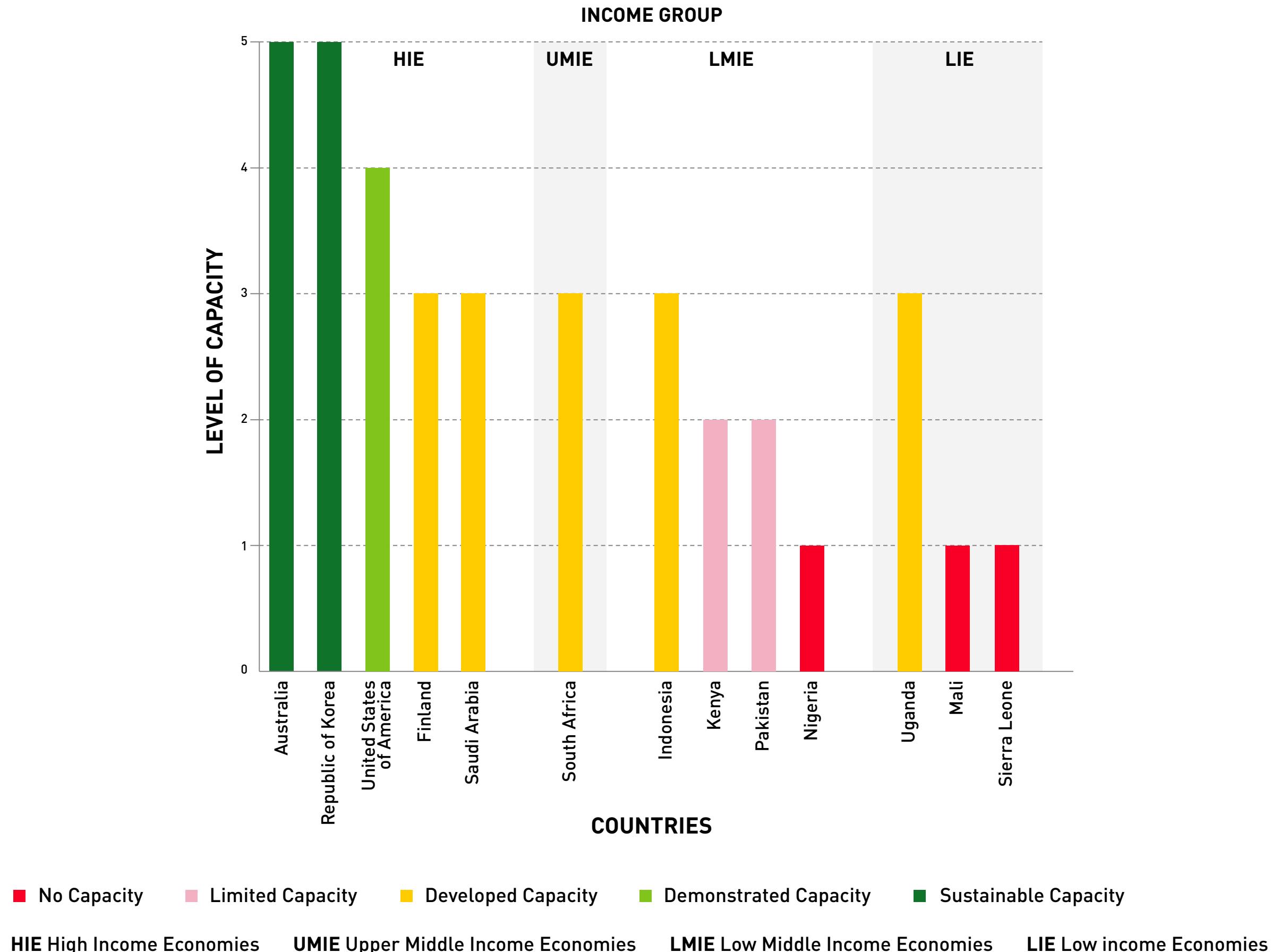
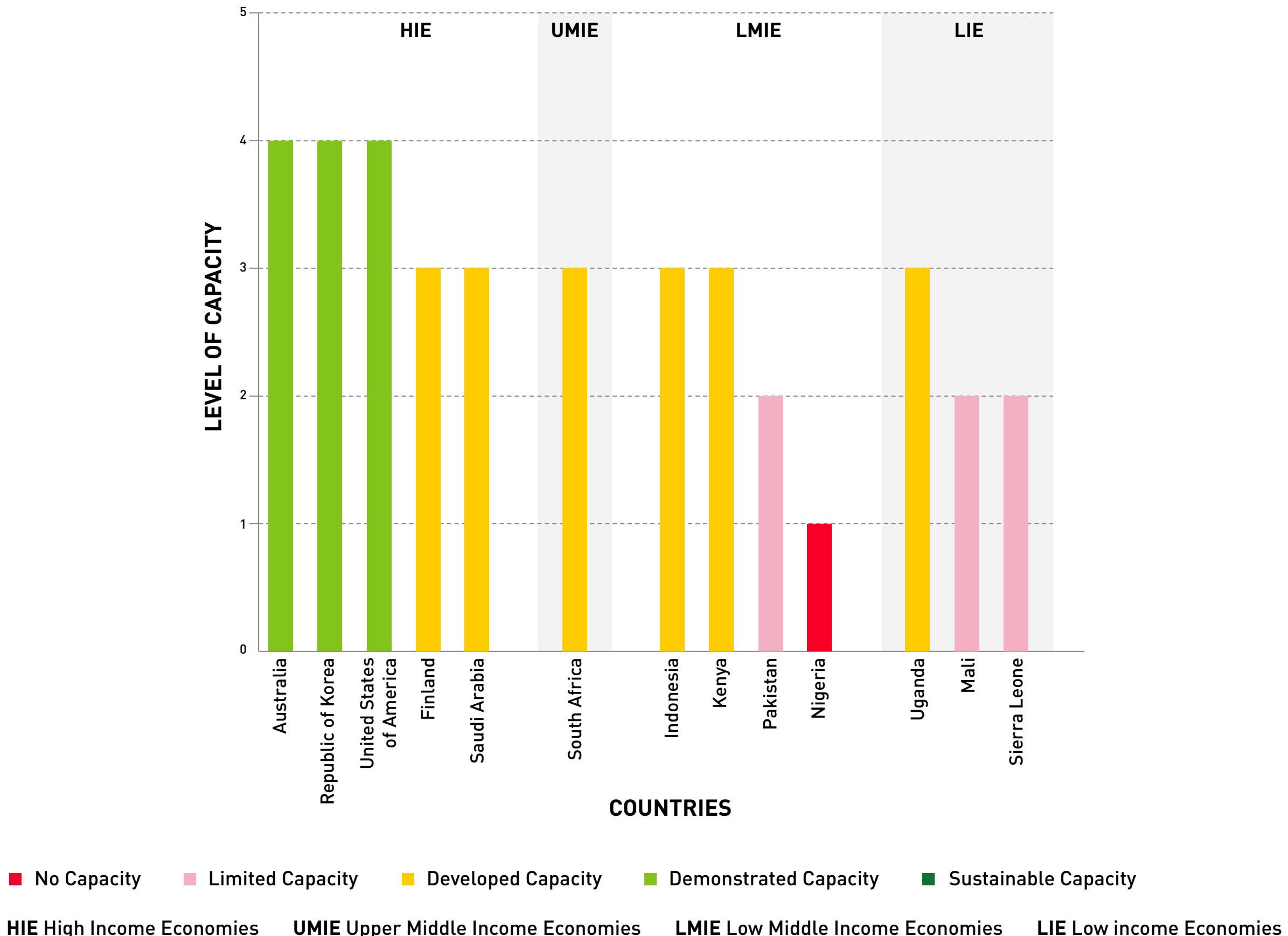


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INCOME GROUP



■ No Capacity ■ Limited Capacity ■ Developed Capacity ■ Demonstrated Capacity ■ Sustainable Capacity

HIE High Income Economies **UMIE** Upper Middle Income Economies **LMIE** Low Middle Income Economies **LIE** Low income Economies

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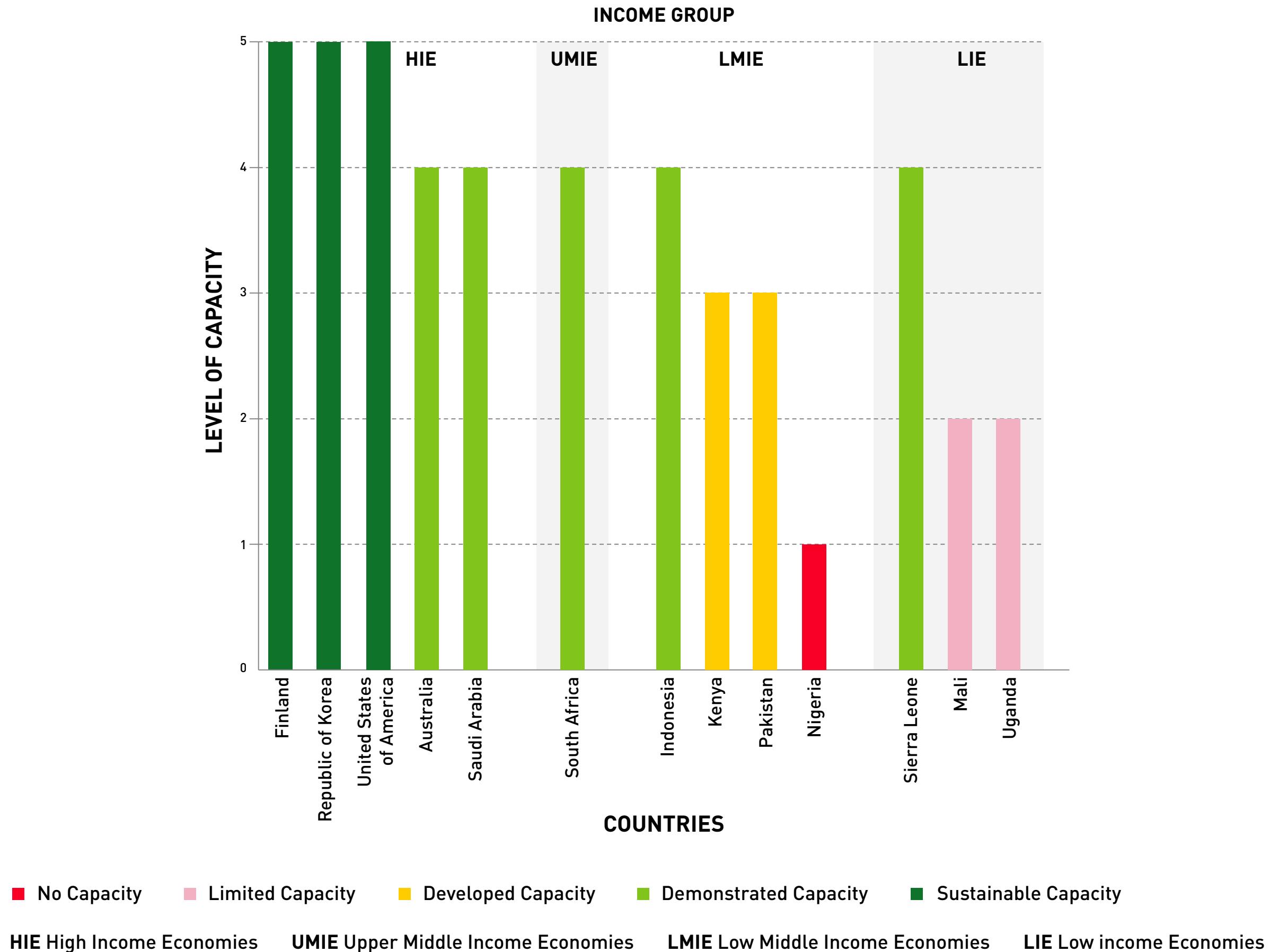
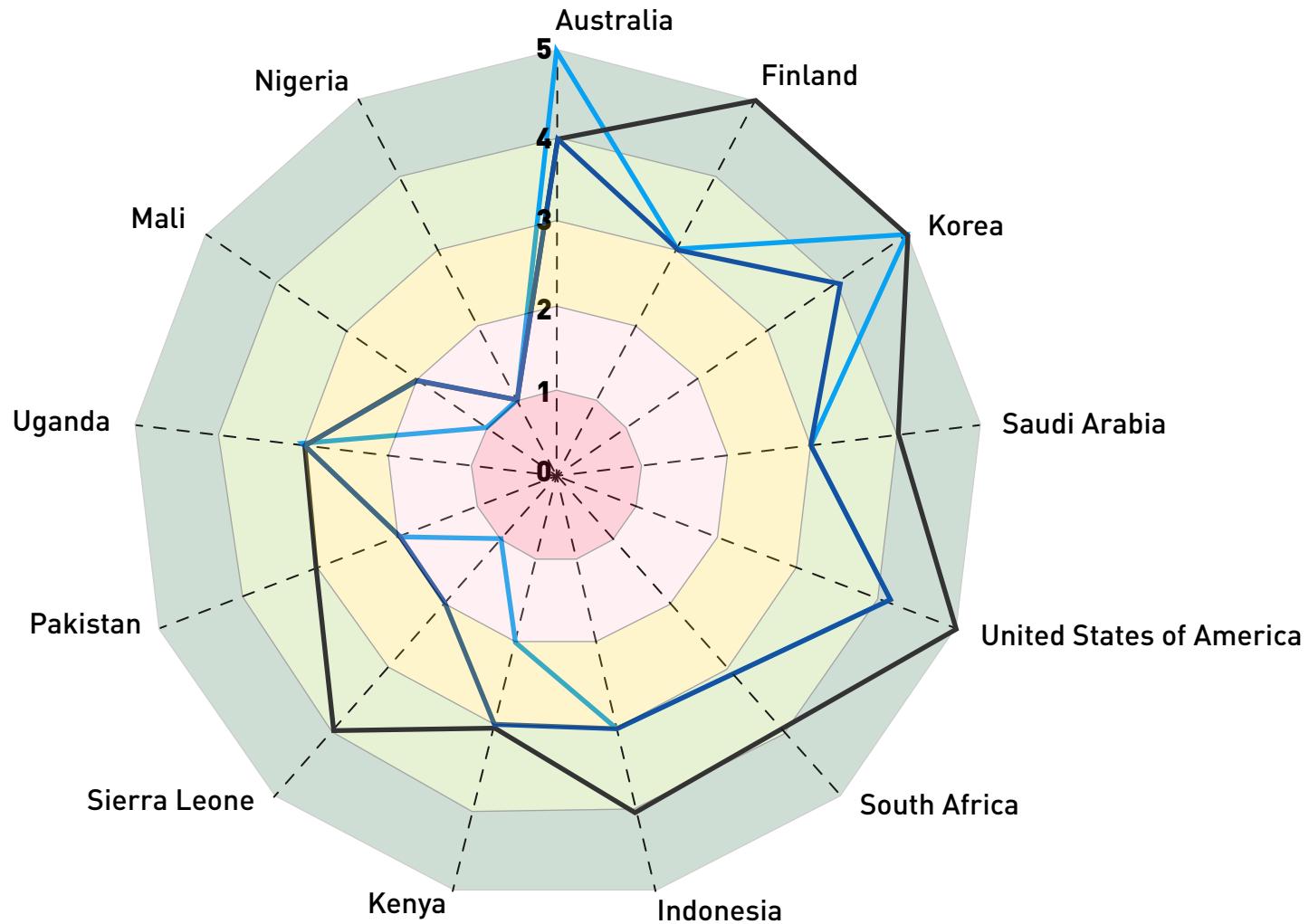


Figure 6. Level of capacity in indicator “linking public health and security authorities”.
A summary of results for countries attending the NTI Global Biosecurity Dialogue Meeting (June 18-20th, 2018).



Indicators

- Whole-of-government biosafety and biosecurity system is in place for human, animal, and agriculture facilities.
- Biosafety and biosecurity training and practices.
- Linking Public Health and Security Authorities.

Level of capacity

- No capacity
- Limited capacity
- Developed capacity
- Demonstrated capacity
- Sustainable

Figure 7. A combined summary on the level of capacity in three indicators related to biosafety, biosecurity, and linking Public Health and Security Authorities.

Results shown for countries attending the NTI Global Biosecurity Dialogue Meeting (June 18-20th, 2018).

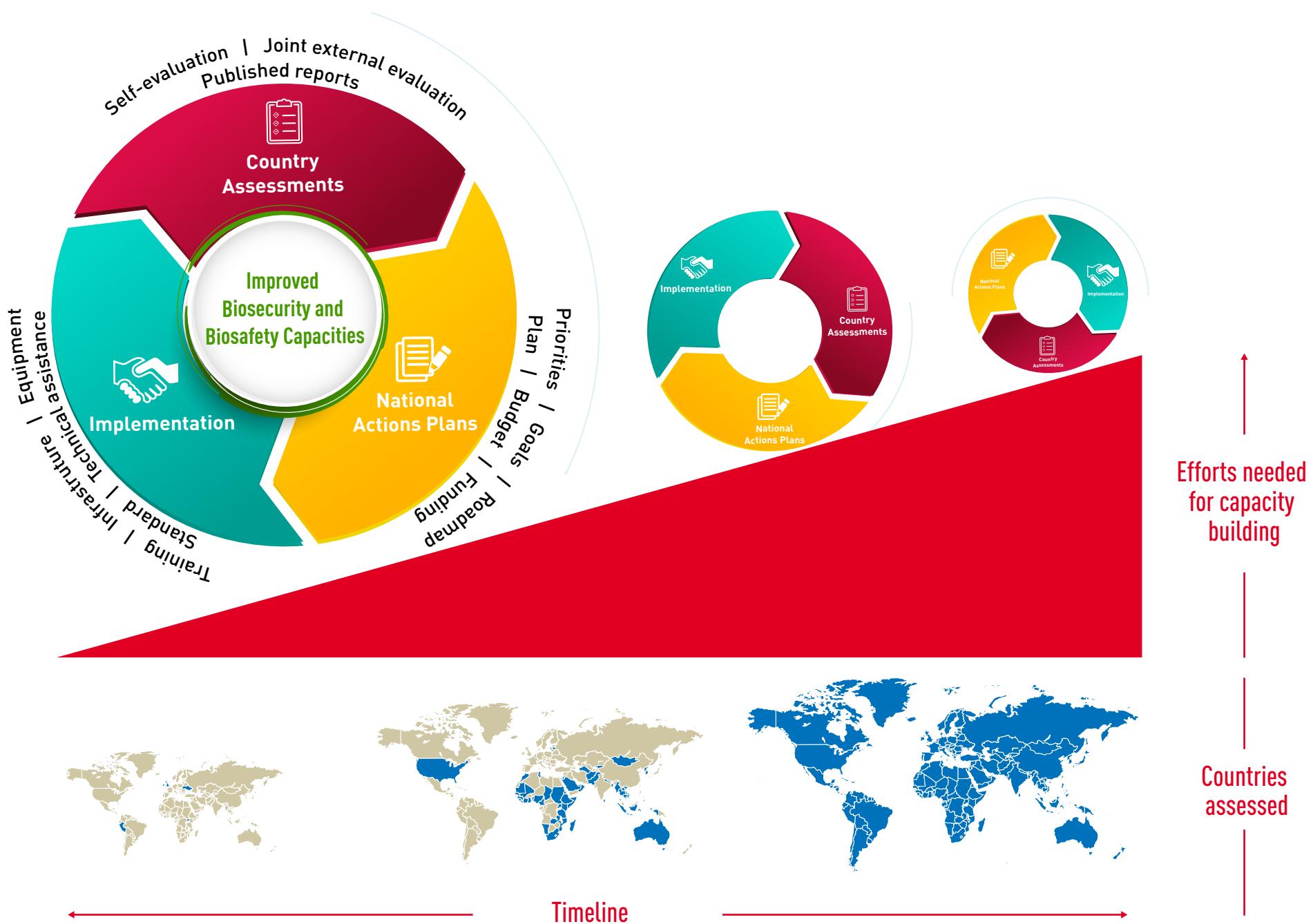


Figure 8. Political commitment and whole-of-government approaches are required to strengthen global biosecurity.

Repeated Country assessments (in 3-5 year intervals) in voluntary countries followed by National action planning and implementation will strengthen national capacities for biosecurity. Ideally, in the near future, gaps are identified and filled in all countries for universal coverage. (Modified from Joint External Evaluation: Team Lead Training. November 2016.)

ATTACHMENTS

I: COMMON MEASUREMENT AND EVALUATION TOOLS NOW ALLOW FOR COLLECTIVE ACTION TO IMPROVE BIOSECURITY CAPABILITY

There are several global initiatives focused on biosecurity, which include national, regional, and global preparation for deliberate biological events, as well as naturally occurring and accidentally produced outbreaks of infectious disease. These are outlined below.

The Biological Weapons Convention

The first multilateral disarmament treaty banning an entire category of weapons, the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction opened for signature in 1972 and entered into force in 1975. The Biological Weapons Convention (BTWC) currently has 180 States Parties and six Signatory States. There are 11 States which have neither signed nor ratified the Convention.

The Convention prohibits the development, production, acquisition, transfer, retention, stockpiling and use of biological and toxin weapons²¹. Under the BTWC, Article X provides for assistance between States parties. The Global Partnership provides a voluntary accounting of assistance provided in accordance with Article X²².

The Global Partnership Against Weapons and Materials of Mass Destruction

The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (the Global Partnership) is a 31-member international initiative aimed at preventing the proliferation of chemical, biological, radiological, and nuclear weapons and related materials²³.

The Global Partnership was established in 2002 by the G8, and the founding countries committed to raise up to \$20 billion over a period of 10 years through the “10 plus 10 over 10” initiative to fund nonproliferation projects, particularly in Russia, to destroy their stockpiles of weapons of mass destruction (WMD)²⁴. The Global Partnership convenes annually as the Global Partnership Working Group.

²¹ “United Nations Office of Geneva.” UNOG - The United Nations Office at Geneva. Accessed May 31, 2018. <https://www.unog.ch>

²² “International Activities of Global Partnership Member Countries Related to Article X of the Biological and Toxin Weapons Convention.” Report. United Nations Office at Geneva. 1-51. [https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/CDD24E00358BB32FC125806000359979/\\$file/GP+BTWC+Article+X+Assistance+\(2016+RevCon\).pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/CDD24E00358BB32FC125806000359979/$file/GP+BTWC+Article+X+Assistance+(2016+RevCon).pdf)

²³ “The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction.” The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction. Accessed May 31, 2018. <http://www.gpwm.com/>

²⁴ “Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (“10 Plus 10 Over 10 Program”).” Nuclear Threat Initiative - Ten Years of Building a Safer World. Accessed May 31, 2018. <http://www.nti.org/learn/treaties-and-regimes/global-partnership-against-spread-weapons-and-materials-mass-destruction-10-plus-10-over-10-program/>

To strengthen global biological security, member countries are committed to implementing concrete projects around the world to combat biological-related terrorism and proliferation. These Global Partnership deliverables, which aim to build global capacity to prevent, detect, and respond to deliberate disease threats, are consistent with and mutually reinforcing of other international initiatives and conventions, including GHSA and BTWC.

Global Partnership Biosecurity Deliverables	
1	Secure and account for materials that represent biological proliferation risks
2	Develop and maintain appropriate and effective measures to prevent, prepare for, and respond to the deliberate misuse of biological agents
3	Strengthen national and global networks to rapidly identify, confirm, and respond to biological attacks
4	Reinforce and strengthen biological non-proliferation principles, practices, and instruments
5	Reduce proliferation risks through the advancement and promotion of safe and responsible conduct in the biological sciences

Table 1. In 2010 a *Strategy for Strengthening Global Biological Security* was developed. The SGBS identified five thematic areas for GP programming and in 2012 these five themes were adopted as specific deliverables through which Partners would seek to prevent and mitigate biological threats.

In October 2017 in Rabat, Morocco, the Italian Presidency of the Global Partnership and the European Union Chemical Biological Radiological and Nuclear Risk Mitigation Centres of Excellence Initiative organized a Regional Conference in Africa to discuss biological priorities and alignment of tools for determining gaps in biosecurity and biosafety. This event was organized in cooperation with the United Nations Interregional Crime and Justice Research Institute (UNICRI) and produced a table of priorities and regional trends supported by 11 participating African countries. The outcomes of this meeting further emphasizing the need to identify clear consensus priority actions to improve national and regional biosecurity capability within the context of multiple initiatives, such as the JEE, the EU CBRN CoE National Action Plan, the 1540 National Implementation Action Plan, and the National Extended Biological and Toxins Weapons Convention Implementation Assistance Programmes under the relevant EU Council Decision (CD-2016/51).

United Nations Security Council Resolution UNSCR 1540

In 2004, the United Nations Security Council unanimously adopted resolution 1540, which affirms support for “the multilateral treaties whose aim is to eliminate or prevent the proliferation of weapons of mass destruction and the importance for all States to implement them fully; it reiterates that none of the obligations in resolution 1540 (2004) shall conflict with or alter the rights and obligations of States Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, the Chemical Weapons Convention, or the Biological Weapons Convention or alter the responsibilities of the International Atomic

Energy Agency (IAEA) and Organization for the Prohibition of Chemical Weapons (OPCW”).

The 1540 Committee oversees and aids States to implement obligations and develop plans. Until now 33 countries have reported the approval of their implementation action plans²⁵.

The Global Health Security Agenda: Action Packages on Biosafety & Biosecurity and Linking Public Health and Security Authorities

The Global Health Security Agenda was launched in February 2014 and it is currently a partnership of over 64 countries, international organizations, and non-governmental stakeholders. The GHSA has been influential in strengthening both national and international collaboration across sectors and in linking relevant global processes to prevent, detect and respond to infectious diseases threats whether naturally occurring or deliberately spread²⁶. Enhancing global biosecurity has been a fundamental element of the GHSA from its inception^{27,28}. In 2016, the GHSA targets for biosecurity, biosafety, and linking public health and security authorities were incorporated into the WHO Joint External Evaluation (see below), allowing for independent measurement and evaluation of national biosecurity and response capability – using common global indicators for the first time.

Biosecurity within the WHO Joint External Evaluation (JEE)

In 2016, the World Health Organization (WHO) published the Joint External Evaluation-IHR 2005 process and tool (JEE). It combines both self and peer-reviewed external assessment and continues with the preparation of an action plan and its implementation^{29, 30,31}.

²⁵ “1540 Committee.” United Nations. Accessed June 08, 2018. <http://www.un.org/en/sc/1540/national-implementation/general-information.shtml>

²⁶ “What Is GHSA?” Global Health Security Agenda. Accessed May 31, 2018. <https://www.ghsagenda.org/>

²⁷ Science, Bayer Crop. “One Health for the 21st Century – Dr. William B. Karesh.” Botrytis-cinerea - Bayer - Crop Science. Accessed May 31, 2018. <https://www.cropscience.bayer.com/en/blogs/corporate-blog/2017/william-b-karesh-one-health-for-the-21st-century>

²⁸ One Health recognizes that the health of people is connected to the health of animals and the environment. 22. One Health recognizes that the health of people is connected to the health of animals and the environment. “One Health.” Centers for Disease Control and Prevention. May 03, 2018. Accessed May 31, 2018. <https://www.cdc.gov/onehealth/index.html>

²⁹ Gozzer, E., Canchihuamán, F., Piazza, M., Vásquez, H., Hijar, G., & Velásquez, A. (2016). [Contribution of Peru in initiatives to promote global health security]. Revista Peruana De Medicina Experimental Y Salud Publica, 33(3), 574-579. [Article in Spanish]. <https://www.ncbi.nlm.nih.gov/pubmed/27831624>

³⁰ Paranjape SM, Franz DR. “Implementing the global health security agenda: lessons from global health and security programs.” Health Secur. 2015;13(1):9–19. <https://www.ncbi.nlm.nih.gov/pubmed/?term=Paranjape+SM%2C+Implementing+the+global+health+security+agenda%3A+lessons+from+global+health>

³¹ Forzley, Michele. “Global Health Security Agenda: Joint External Evaluation and Legislation—A 1-Year Review.” Health Security 15, no. 3 (2017): 312-19. doi:10.1089/hs.2017.0013. <https://www.ncbi.nlm.nih.gov/pubmed/?term=Forzley+M.+Global+Health+Security+Agenda%3A+Joint+External+Evaluation+and+Legislation%E2%80%94A+1-Year+Review>

A key feature of the JEE approach to biosecurity assessment is its multi-sectoral stakeholder approach, which convenes not only human health entities but also security, defense, foreign affairs, and other relevant sectors to conduct comprehensive assessments.

While the JEE have been successful – 62 countries have conducted and published JEE to date – the assessments have not included robust biosecurity expertise and need yet to produce a larger number of published national action plans. Such plans will be vital for determining specific, costed, next steps and allowing for more collective financing from host governments, regional organizations, and global assistance providers.

The JEE Alliance

The JEE Alliance is an informal platform of 69 members, including 30 countries, international organizations, financial institutions, foundations, non-governmental organizations and the private sector. Co-chaired by Australia and Finland, its work focuses on supporting the process of developing and implementing national action plans based on the JEE evaluations. The JEE Alliance is focused on all of the capabilities within the JEE, including financing for gaps. Since biosecurity is a persistent JEE gap, it is one of the potential priority areas for the JEE Alliance as its work plans are developed.

II: BIOSECURITY RELATED INDICATORS IN THE JOINT EXTERNAL EVALUATION TOOL

BIOSAFETY AND BIOSECURITY

Target: FA whole-of-government multisectoral national biosafety¹ and biosecurity² system with dangerous pathogens³ identified, held, secured and monitored in a minimal number of facilities according to best practices⁴; biological risk management training and educational outreach conducted to promote a shared culture of responsibility⁵, reduce dual-use risks, mitigate biological proliferation and deliberate use threats, and ensure safe transfer of biological agents; and country-specific biosafety and biosecurity legislation, laboratory licensing and pathogen control measures in place as appropriate.

As measured by: (1) Existence of a national framework for pathogen biosafety and biosecurity, strain collections, containment laboratories, that includes identification and storage of national strain collections in a minimal number of facilities from all sectors. (2) Existence of comprehensive oversight and monitoring systems.

Desired impact: Implementation of a comprehensive, sustainable and legally embedded national oversight programme for biosafety and biosecurity, including the safe and secure use, storage, disposal and containment of pathogens found in laboratories and a minimal number of holdings across the country, and involving research, diagnostic and biotechnology facilities within all sectors⁶. A cadre of biological risk management experts possessing the skillset to train others is established within their respective institutions. Strengthened, sustainable biological risk management best practices are in place using common educational materials. Rapid and culture-free diagnostics are promoted as a facet of biological risk management. Safe and compliant transport of infectious substances is also taken into account according to national and international regulations as appropriate.

¹ - Laboratory biosafety describes the containment principles, technologies and practices that are implemented to prevent unintentional exposure to pathogens and toxins, or their accidental release.

² - Laboratory biosecurity describes the protection, control and accountability for valuable biological materials within laboratories as well as information related to these materials and dual-use research, in order to prevent their unauthorized access, loss, theft, misuse, diversion or intentional release.

³ - Dangerous pathogens and toxins – The informal Australia Group provides a List of human and animal pathogens and toxins for export control (http://www.australiagroup.net/en/human_animal_pathogens.html), accessed 23 November 2017).

⁴ - It is suggested that minimal/best practice would follow the WHO Laboratory biosafety manual?

⁵ - Responsible life sciences research for global health security: a guidance document. WHO/HSE/GAR/BDP/2010.2. Geneva: World Health Organization; 2010 (http://www.who.int/csr/resources/publications/publications/HSE_GAR_BDP_2010_2/en/ (accessed 21 November 2017)).

⁶ - Within both human and animal health sectors.

		Indicators: Biosafety and biosecurity	
Score	P.6.1 Whole-of-government biosafety and biosecurity system in place for all sectors (including human, animal and agriculture facilities)	P.6.2 Biosafety and biosecurity training and practices in all relevant sectors ⁷ (including human, animal and agriculture)	
No capacity - 1	Elements of a comprehensive national biosafety and biosecurity system, such as policy instruments and proper financing ⁸ , are not in place	No biological biosafety and biosecurity training or plans are in place	
Limited capacity - 2	<p>Some, but not all, elements of a comprehensive biosafety and biosecurity system are in place. The country is:</p> <ul style="list-style-type: none"> Starting the process to monitor and develop an updated record and inventory of pathogens within facilities that store or process dangerous pathogens and toxins and what they house Developing, but has not finalized, comprehensive national biosafety and biosecurity regulatory framework Developing laboratory licensing 	<p>Country has conducted a training needs assessment and identified gaps in biosafety and biosecurity training but has not yet implemented comprehensive training</p> <p>General lack of awareness among the laboratory workforce of international biosafety and biosecurity best practices for safe, secure and responsible conduct</p> <p>Country does not yet have sustained academic training in institutions proportionate to the assessed risks, including training those who maintain or work with dangerous pathogens and toxins</p>	
Developed capacity - 3	<p>Comprehensive national biosafety and biosecurity system is being developed. The country is:</p> <ul style="list-style-type: none"> Finalizing the process to support active monitoring and maintaining of up-to-date records and pathogen inventories within facilities that store or process dangerous pathogens and toxins Finalizing the development and implementation of comprehensive national biosafety and biosecurity regulatory framework including licensing Finalizing the development and implementation of pathogen control measures, operational handling and containment failure reporting systems Starting the consolidation of dangerous pathogens and toxins into a minimum number of facilities Starting to put into place tools and resources to support diagnostics that preclude culturing dangerous pathogens Starting to put in place incident and emergency and response programmes 	<p>Country has training programmes in place proportionate to the assessed risks and has begun implementation</p> <p>Country has specific training programmes in place at most facilities housing or working with dangerous pathogens and toxins</p> <p>Training on biosafety and biosecurity has been provided to staff at some, but not all, facilities that maintain or work with dangerous pathogens and toxins</p> <p>Country is developing sustained academic training proportionate to the assessed risks, including the one for those who maintain or work with dangerous pathogens and toxins</p>	

7 - Relevant sectors include, at minimum, the ministries or agencies that are key to this technical area, such as human health, animal health, environment, food safety, defence, private sector.

8 - Such a comprehensive biosafety and biosecurity system would cover legislation, regulations, requirements and financing.

<p>Biosafety and biosecurity system is developed, but not sustainable. The country is:</p> <p>Actively monitoring and maintaining an updated record and inventory of pathogens within facilities that store or process dangerous pathogens and toxins</p> <p>Implementing enacted comprehensive national biosafety and biosecurity regulatory framework</p> <p>Implementing laboratory licensing</p> <p>Implementing pathogen control measures, operational handling and containment failure reporting systems</p> <p>Completing the consolidation of dangerous pathogens and toxins into a minimum number of facilities</p> <p>Employing diagnostics that preclude culturing dangerous pathogens</p> <p>Operating incident and emergency and response programmes</p>	<p>Country has training programmes in place proportionate to the assessed risks, including those that house or work with dangerous pathogens and toxins</p> <p>Country has in place academic training proportionate to the assessed risks, including institutions that train those who maintain or work with dangerous pathogens and toxins</p> <p>Country has limited ability to self-sustain all of the above</p>
<p>Demonstrated capacity – 4</p>	<p>Sustainable multisectoral biosafety and biosecurity system is in place</p> <p>Ministries have made available adequate funding and political support for a comprehensive national biosafety and biosecurity system, including maintenance of facilities and equipment</p>
<p>Sustainable capacity – 5</p>	<p>Country has sustainable training programmes included into university/college curricula of pre-service training and into continuing education programmes. Staff competence is assessed and exercises are conducted periodically</p> <p>Country has funding and capacity to sustain all of the above</p> <p>Review of training needs assessment is conducted periodically and refresher training on needs areas are conducted periodically</p> <p>Training on emergency response procedures are provided periodically</p>

Contextual questions: N/A

Technical questions:

P.6.1 Whole-of-government biosafety and biosecurity system in place for all sectors (including human, animal and agriculture facilities)

1. Is there active monitoring and development of an updated record and inventory of pathogens within facilities that store or process dangerous pathogens and toxins?
 - a. Does the country have in place an updated record of where and in which facilities dangerous pathogens and toxins are housed?
 - i. Have collections of pathogens and toxins been identified?
 - ii. What guidance is to be provided to countries which do not have supporting systems and legislation already in place to enable them to require inventory records of "dangerous pathogens and toxins" kept by facilities?

- iii. Is there an agreed list of "dangerous pathogens and toxins" to which this question applies?
- iv. How often are facilities expected to update such records?
- 2. Is there a comprehensive national biosafety and biosecurity regulatory framework being enacted?
 - a. Does the country have biosecurity legislation and/or regulations in place? Are they being implemented?
 - b. Does the country have biosafety legislation and/or regulations in place? Are they being implemented?
 - c. Describe the following from the country's national biosecurity legislation, regulations or frameworks, and country's national biosafety legislation, regulations or frameworks.
 - i. How is this information shared with laboratories at subnational levels within the country?
 - ii. Are regulations and/or guidelines for biosecurity followed by laboratories within the country? What about for biosafety?
 - iii. Describe biosecurity monitoring activities. Describe biosafety monitoring activities.
 - iv. Has a third party assessed biosecurity at national laboratory facilities? Was a biosafety assessment also done?
 - 1. When was the assessment done?
 - 2. Have the recommendations from those biosecurity and biosafety assessments been put into place?
 - v. What type of laboratory requires a licence in the country?
 - vi. Are there common licence conditions/safety and security requirements for all licensed laboratories? If so, what are they?
 - vii. How is compliance with licensing requirements monitored?
 - viii. Is there adequate availability of funding to support biosafety and biosecurity programmes/initiatives and their oversight and enforcement at the ministry level?
 - ix. Is there a mechanism for biosecurity oversight of dual-use research and responsible code of conduct for scientists?
- 3. Are the laboratory licensing and pathogen control measures, including requirements for physical containment and operational practices, and containment and failure reporting systems being implemented?
 - a. Physical security
 - i. Are appropriate security measures in place to minimize potential inappropriate removal or release of biological agents (such as theft, earthquake, flood)?
 - b. Information security
 - i. Is access to sensitive information (such as inventory of agents and toxins) controlled by adequate policies and procedures?
 - c. Transportation security
 - i. Are procedures for a safe and secure transport of culture, specimens, samples and other contaminated materials established and followed?
 - ii. Is there national legislation for the transportation of dangerous goods, including pathogens?
 - d. Personnel security
 - i. Is there a mechanism to determine which personnel are authorized to access pathogens of security concern?
 - ii. Is there evidence that this mechanism to authorize personnel is being implemented correctly?

- e. Biosafety and biosecurity practices at facilities housing or working with dangerous pathogens
- Are site-specific biosafety and biosecurity management programmes and supporting documents (manuals, SOPs, job aides, records) available to include biosafety, biosecurity, incident response and emergency plans (such as for explosion, fire, flood, worker exposure, accident or illness, major spillage)?
 - Are roles and responsibilities related to biosafety and biosecurity management defined and documented (biosafety officer, security manager)?
 - Have the biosafety and biosecurity risks been assessed and categorized?
 - Are biosafety and biosecurity control measures described in an action plan?
 - Are there mechanisms to ensure that personnel: are suitable and competent (e.g. best practices) in human resources management (e.g. verification of prior education and employment, periodic performance reviews), have successfully completed training/mentorship programmes, and have the ability to work unsupervised?
 - Is there a system in place to conduct audits of laboratory facilities?
 - If so, are audits performed regularly?
 - What organization conducts these audits? Are these within the government or external?
 - Are audits conducted by the national authority (such as Institutional Biosafety Committee) or by the local Biological Safety Officer?
 - Are audits conducted by the national authority (such as Institutional Biosafety Committee) or by the local Biological Safety Officer?
 - Which types of laboratories are subject to these audits?
 - Do laboratories ensure that best practices for biosafety and biosecurity are in place? If yes, how?
 - Do any of the national laboratories have other relevant classifications (i.e. FAO/OIE/WHO Collaborating Centres/Reference Laboratories)?
 - Are dangerous pathogens and toxins consolidated into a minimum number of facilities?
 - Has the country considered consolidating the locations for dangerous pathogens and toxins?
 - If not, will consolidation be considered?
 - Have collections of dangerous pathogens been consolidated into a minimum number of facilities?
 - Are they employing diagnostics that preclude culturing dangerous pathogens?
 - Does the country utilize diagnostic tests that eliminate the need for culturing dangerous pathogens?
 - Are they implementing oversight and enforcement mechanisms, and have ministries made available adequate funding to support the comprehensive national biosafety and biosecurity system?
 - Are there mechanisms for oversight, enforcement and attribution for biosafety and biosecurity legislation, regulations and/or guidelines?
 - Does the country have funding for these activities? Is the funding source sustainable?
 - Are the new facilities planned with long-term commitment of resources for operation and maintenance and formally commissioned before opening?
 - Can the biosafety cabinets be serviced locally?
 - Are there sufficient national resources (budget and human) to ensure proper and timely maintenance of facilities and equipment?
 - Is there an appropriate waste management policy at the national level and is it being implemented locally?

11. Does each facility have sufficient personal protective equipment based on local risk assessment?
 12. Is there a framework to document, report, investigate and address any incidents and accidents at the facility and national levels?
 13. Are national regulations in place and up-to-date for the transport of infectious substances (Categories A and B)?
 - a. If yes, do local carriers ensure the transport of infectious substances according to national regulations?
 - b. Do the people responsible for the shipment of specimens have access to training on infectious substance transport?
 - i. If yes, are these trainings in line with United Nations regulations on the transport of infectious substances?
 14. Do laboratory personnel have equal access to occupational/worker health services in all facilities?
 15. Is there a specific vaccination policy (pre-exposure prophylaxis) for laboratory personnel (hepatitis B and other relevant diseases)?
 16. Is post-exposure prophylaxis treatment provided to laboratory workers in all facilities?
 17. Are laboratory-acquired infections and other incidents reported?
 - a. Who does it get reported to?
 - b. Is there a national snapshot as to what is happening across the country?
- P.6.2 Biosafety and biosecurity training and practices in all relevant sectors (including human, animal and agriculture)**
1. Does the country have training programmes in place at all facilities, including those that house or work with dangerous pathogens? What about biosafety training?
 - a. Is biosafety and biosecurity training in place across all facilities, including those that house or work with dangerous pathogens and toxins?
 1. a. Is biosafety and biosecurity training in place across all facilities, including those that house or work with dangerous pathogens? What about biosafety training?
 2. Has training on biosafety and biosecurity been provided to staff at all facilities, including those that maintain or work with dangerous pathogens and toxins?
 - a. Does the country conduct needs assessments for biosafety and biosecurity trainings? If so, how often?
 - b. How often are staff trained on biosafety procedures? What about for biosecurity procedures?
 - c. How often are staff tested or exercised on biosafety procedures? What about for biosecurity procedures?
 - d. How are these exercises monitored and assessed?
 - e. Do these exercises include a process to document successes and areas for improvement?
 - f. Are there corrective action plans in place?
 3. Does the country have in place sustained academic training in institutions, including those that train those who maintain or work with dangerous pathogens and toxins?
 - a. Do academic institutions in the country have biosafety training programmes in place, including those training to work with dangerous pathogens?
 4. Does the country have the funding and capacity to sustain biosafety and biosecurity training?
 5. How does the national system ensure access to transport providers for national and international transportation of "infectious substances"?
 6. Is there induction and refresher training for all laboratory staff on biosafety and biosecurity?
 7. Is there a mechanism to ensure and monitor staff competence and standards of training at all laboratories?

Documentation or evidence for level of capability

- Documentation of dangerous pathogen collections housed in the country
- Establishment, enactment and enforcement of any relevant national legislation on biosafety and biosecurity
- Biosafety officers trained, receiving ongoing training and stationed at all laboratories that have the potential to handle dangerous pathogens and high risk experiments
- Policy document for biorisk or biosafety management in a facility is a written policy statement that is signed and reviewed annually
 - OIE country PVS Evaluation mission report (also see section "Prevent – Zoonotic disease")
 - OIE country PVS Gap Analysis report (also see section "Prevent – Zoonotic disease")
 - OIE country PVS Laboratory mission report

LINKING PUBLIC HEALTH AND SECURITY AUTHORITIES

Target: Country conducts a rapid, multisectoral response¹ for any event of suspected or confirmed deliberate origin, including the capacity to link public health and law enforcement, and to provide timely international assistance.

As measured by: Evidence of at least one response, in the previous year, that effectively links public health and law enforcement, or a formal exercise or simulation involving leadership from the country's public health and law enforcement communities.

Desired impact: Development and implementation of a MoU or other similar framework outlining roles, responsibilities and best practices for sharing relevant information between and among appropriate human and animal health, law enforcement and defence personnel, and validation of the MoU through periodic exercises and simulations. Countries will develop and implement model systems to conduct and support joint epidemiological and criminal investigations to identify and respond to suspected biological, chemical or radiological incidents of deliberate origin in collaboration with individual Biological and Toxin Weapons Convention (BTWC) of States Parties, FAO, International Atomic Energy Agency (IAEA), International Criminal Police Organization (INTERPOL), OIE, Organisation for the Prohibition of Chemical Weapons (OPCW), the United Nations Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons, WHO and other relevant regional and international organizations as appropriate.

¹ - Multisectoral collaboration is key to engaging in an effective public health emergency response. Security authorities may include law enforcement, border control officers, defence and/or customs enforcement. Effective multisectoral collaboration should also include food safety inspectors, as well as animal health, radiological safety and chemical safety authorities.

Score	Indicator: Linking public health and security authorities (e.g. law enforcement, border control, customs) linked during a suspect or confirmed biological, chemical or radiological event
No capacity - 1	No legislation, relationships, protocols, MoUs or other agreements exist between public health, animal health, radiological safety, chemical safety and security authorities to address all hazards
Limited capacity - 2	Points of contact and triggers for notification and information sharing have been identified and shared between public health, animal health, radiological safety, chemical safety and security authorities to address all hazards
Developed capacity - 3	MoU or other agreement/protocol, that includes at least roles, responsibilities, SOPs and information to be shared, exists between public health, animal health, radiological safety and security authorities within the country and has been formally accepted to address all hazards
Demonstrated capacity - 4	At least one public health emergency response or exercise in the previous year that included information sharing with security authorities using the formal MoU or other agreement/protocol related to all hazards Public health and security authorities engage in a joint training programme to orient, exercise and institutionalize knowledge of MoU or other agreements related to all hazards
Sustainable capacity - 5	Public health and security authorities exchange reports and information on events of joint concern at national, intermediate and local levels on a regular basis using the formal MoU or other agreement/protocol Public health and security authorities engage in a joint training programme to orient, exercise and institutionalize knowledge of the MoU or other agreement related to all hazards

Contextual questions: N/A

Technical questions:

R.3.1 Public health and security authorities (e.g. law enforcement, border control, customs) linked during a suspect or confirmed biological, chemical or radiological event

1. Is there a MoU or other agreement between public health and security authority entities at the national level?
 - a. If yes, which security authority organizations are covered by a MoU or other agreement – law enforcement, border control, customs enforcement, food safety in inspection, radiological safety and chemical safety?
 - b. If not, is there a MoU or other agreement between public health and another sector (such as agriculture, defence, foreign affairs) that could be used as a sample agreement to promote information sharing and collaboration during emergency events? Are there agreements between public health and security authorities at any intermediate and/or local levels?
2. Have trainings been conducted jointly (at an intermediate level (regional) or national level) including for both public health and security authorities on topics related to information sharing and joint investigations/responses?
3. Are there SOPs or agreements in place for coordination of a joint response to public health and other emergencies at official locations, such as points of entry where both public health and security authorities have operational safety and health security responsibilities?
4. Are there SOPs or agreements in place for a joint/shared risk assessment during events of public health and security significance?

5. Is there legislation in place that allows the government to detain/quarantine an individual who presents a public health risk?
6. How are potential biological, chemical and radiological events that may have deliberate motives identified in the country? Provide any plans that have been drafted that cover response to possible biological, chemical and radiological events.
7. Is there a functional mechanism for collaboration and timely and systematic information exchange between public health and law enforcement agencies in case of deliberate and/or accidental events?
8. Are public health experts involved in emergency response linked to the BTWC? Has the country participated in an exercise, simulation or response in the past year that involves leadership from both public health and security authorities? If yes, describe the exercise, simulation or response.
 - a. Describe any corrective actions that were recommended on how the public health organization should coordinate with security authorities.
9. Are reports regularly shared between public health and any security authorities within the country? Is there a mechanism in place to encourage regular reporting?
 - a. What types of reports are shared from public health entities to security authorities regularly?
 - b. What types of reports are shared from security authorities to the public health system regularly?
 - c. How often are the informational reports shared?
10. Is there a country-specific joint investigations curriculum in place to train public health and law enforcement entities on joint investigations?
11. Describe how the national government is connected to INTERPOL. What ministry is charged with interacting with INTERPOL?

Documentation or evidence for level of capability

- SOPs or emergency response plans that would include security authorities
- Informational reports that are regularly shared with security authorities

References:

- WHO–OIE operational framework for good governance at the human–animal interface: Bridging WHO and OIE tools for the assessment of national capacities. WHO and OIE; 2014 (http://www.oie.int/fileadmin/Home/fr/Media_Center/docs/pdf/WHO_OIE_Operational_Framework_Final2.pdf accessed 29 November 2017).
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