

Global Health Security Agenda: Action Packages

Preamble

The Global Health Security Agenda (GHSa) is an effort by nations, international organizations, and civil society to accelerate progress toward a world safe and secure from infectious disease threats; to promote global health security as an international priority; and to spur progress toward full implementation of the World Health Organization (WHO) International Health Regulations 2005 (IHR), the World Organization for Animal Health (OIE) Performance of Veterinary Services (PVS) pathway, and other relevant global health security frameworks.

In order to encourage progress toward these goals, the “Action Packages” concept was developed to facilitate regional and global collaboration toward specific GHSa objectives and targets. Following the May 2014 GHSa Commitment Development meeting in Helsinki countries identified eleven discrete GHSa Action Packages, which were discussed further at the August 2014 Global Infectious Diseases Meeting in Jakarta. All countries that support the GHSa are welcome to participate in one or more Action Packages and are asked to consider specific commitments across these areas on a national, regional, or global basis.

The 11 Action Packages in this document have been agreed upon by Action Package leaders and contributing countries, with the understanding that they may be changed or added to over time. Technical experts from countries around the world have worked collaboratively over the past months to shape these Action Packages and will continue to lead and implement them following the GHSa meeting at the White House on September 26, 2014. As of this date, 39 countries have committed to contribute to the Action Packages, and others are encouraged to join as the GHSa moves forward. In developing these Action Packages, the goal has been to translate political support into action and to recruit countries to join in working to achieve GHSa objectives.

These Action Packages are being publicly released at this stage to further increase understanding and encourage entities outside of government to take part in the GHSa as part of a whole-of-society approach. We encourage non-governmental stakeholders—including foundations, development banks and non-governmental organizations—to contribute to the development and implementation of these Action Packages.

Purpose and Organization

The purpose of Action Packages and the underlying Prevent-Detect-Respond framework is to:

- Focus international discussion toward specific, coordinated actions in support of the GHSa;
- Highlight measurable approaches countries can adopt to accelerate, monitor and report GHSa progress; and
- Provide a mechanism by which countries can make specific commitments and take leadership roles in the GHSa. Countries can consider commitments to one or more Action Packages and may agree to lead, co-lead or actively participate in work with other countries regionally or globally to implement a unified set of actions.

Each Action Package includes the relevant five-year target, an indicator by which to measure progress, desired impact, current country commitments, five-year action items, and lists of baseline assessment, planning, monitoring, and evaluation activities necessary to implement the action items. It is understood that each Action Package will evolve as current commitments are delivered and new commitments are pledged.

GHSA activities should be conducted in collaboration with relevant local, national, and international stakeholders and in coordination with the relevant activities of the WHO, Food and Agriculture Organization of the United Nations (FAO), OIE, and INTERPOL. Wherever practicable and strategic, GHSA Action Packages and commitments should reflect an appropriate level of multidisciplinary (e.g., “One Health”) coordination to meet respective GHSA targets.

Progress and Next Steps

All countries are welcome and encouraged to lead or join any of the GHSA Action Packages. Progress in the development of GHSA commitments—including pledges to participate in Action Packages and to support the GHSA with other national and international activities—will be reviewed regularly, and gaps and next steps will be highlighted through the GHSA Steering Group and annual GHSA Ministerial going forward. Countries wishing to advance or assist others in GHSA activities and goals may also wish to coordinate with international organizations who, individually or collectively, have developed specific tools and/or programs that can be tailored to build capacity and address country development needs.

Acronyms

AMR - antimicrobial resistance

EOC - emergency operations center

FAO - Food and Agriculture Organization of the United Nations

FETP - Field Epidemiology Training Program

GHSA - Global Health Security Agenda

IDSR - Integrated Disease Surveillance and Response

IT - information technology

IHR - International Health Regulations (2005)

OIE - World Organization for Animal Health

PHEIC - public health emergency of international concern

PVS - Performance of Veterinary Services

RRT - rapid response team

SIA - supplementary immunization activities

VPD - vaccine-preventable disease

WAHIS - World Animal Health Information System

WHO - World Health Organization

GHSA Antimicrobial Resistance Action Package

(GHSA Action Package Prevent-1)

Five-Year Target: Support work being coordinated by WHO, FAO, and OIE to develop an integrated and global package of activities to combat antimicrobial resistance, spanning human, animal, agricultural, food and environmental aspects (i.e. a one-health approach), including: a) Each country has its own national comprehensive plan to combat antimicrobial resistance; b) Strengthen surveillance and laboratory capacity at the national and international level following agreed international standards developed in the framework of the Global Action plan, considering existing standards and; c) Improved conservation of existing treatments and collaboration to support the sustainable development of new antibiotics, alternative treatments, preventive measures and rapid, point-of-care diagnostics, including systems to preserve new antibiotics.

As Measured by:

- (1) Number of comprehensive plans to combat antimicrobial resistance agreed and implemented at a national level, and yearly reporting against progress towards implementation at the international level
- (2) Number of countries actively participating in a twinning framework, with countries agreeing to assist other countries in developing and implementing comprehensive activities to combat antimicrobial resistance, including use of support provided by international bodies to improve the monitoring of antimicrobial usage and resistance in humans and animals.

Desired National Impact: Decisive and comprehensive action to enhance infection prevention and control activities to prevent the emergence and spread of AMR, especially among drug-resistant bacteria. Nations will strengthen surveillance and laboratory capacity, ensure uninterrupted access to essential antibiotics of assured quality, regulate and promote the rational use of antibiotics in human medicine and in animal husbandry and other fields as appropriate, and support existing initiatives to foster innovations in science and technology for the development of new antimicrobial agents.

Country Commitments to Action Package:

- **Leading countries:** Canada, Germany, Netherlands, Sweden, United Kingdom
- **Contributing countries:** Australia, India, Indonesia, Italy, Japan, Norway, Portugal, Switzerland, Thailand, United States
- **Contributing international organizations:** FAO, OIE, WHO

Five-Year Action Items:

Consistent with the WHO process to coordinate development of an AMR Global Action Plan:

1. Develop a national action plan, **based on a one health approach**, to combat antimicrobial resistance which includes:
 - best practice in hygiene and infection prevention measures,
 - the presence of reliable surveillance systems for antimicrobial resistances and antibiotic consumption, considering the different sectors: hospitals, outpatient facilities and the community as well as in veterinary medicine and in animal husbandry,
 - uninterrupted access to essential and affordable antibiotics of assured quality,
 - measures for controlled and restrained use of antimicrobials,
 - actions to raise awareness of AMR issues in order to improve the effective use of antibiotics by public and professionals,

- measures that minimize the occurrence of residues of antibiotics and the spread of resistant bacteria in(to) the environment.
2. Develop and implement guidelines and standards for infection prevention.
 3. Develop and use new guidelines or encourage use of existing guidelines, training and other resources to promote the prudent and restrained use of antimicrobials, in both human, animals and other areas when appropriate.
 4. Ensure access to at least one reference laboratory for each country capable of identifying at least three of the seven WHO priority AMR pathogens using standardized, reliable detection assays, and reporting these results. Alternatively one reference laboratory for each of the three priority pathogens should be in place.
 5. Support ongoing work with international organizations to develop and implement a harmonized approach for monitoring and surveillance of antimicrobial drug use and antimicrobial resistance in humans and animals, including interpretive criteria for susceptibility reporting across WHO, FAO, and OIE regional surveillance programs. Using this information, these organizations can strengthen outreach activities to influence health professionals (veterinary and human) on the need for early recognition of AMR and prudent use of antimicrobials to limit the spread of AMR.
 6. Collaboration in international initiatives to encourage and accelerate the discovery and development of new generations of antibiotics, including new models for controlled distribution and use of these new antibiotics.
 7. Collaboration in international initiatives to encourage and accelerate the discovery and development of inexpensive and rapidly deployable, point-of-care diagnostics.

Baseline Assessment and Planning Activities

1. Identification of relevant stakeholders spanning human, animal, agricultural, food and environmental aspects
2. Analysis of the present status on the national level and identification of areas that need to be strengthened (e.g. surveillance systems, capacity and capability of existing laboratories for the diagnosis of AMR)
3. Identification of guidelines (e.g. from WHO) that can be adapted to the situation in the country
4. Use WHO's IHR Monitoring Framework, OIE's PVS Pathway, and other appropriate instruments to identify countries' priorities for strengthening core competencies.

Monitoring and Evaluation Activities

1. Introduce arrangements which are consistent with the WHO process to coordinate development of an AMR Global Action Plan

GHSA Zoonotic Disease Action Package

(GHSA Action Package Prevent-2)

Five-Year Target: Adopted **measured** behaviors, policies and/or practices that minimize the spillover of zoonotic diseases from lower animals into human populations.

As Measured by: Identify the five zoonotic diseases/pathogens of greatest public health concern and strengthen existing surveillance systems for-prioritized zoonoses.

Desired Impact: Implementation of guidance and models on behaviors, policies and practices to minimize the spillover, spread, and full emergence of zoonotic disease into or out of human populations prior to the development of efficient human-to-human transmission. Nations will develop and implement operational frameworks—based on international standards, guidelines, and successful existing models—that specify the actions necessary to promote One Health approaches to policies, practices and behaviors that could minimize the risk of zoonotic disease emergence and spread.

Country Commitments to Action Package:

- **Leading countries:** Indonesia, Vietnam
- **Contributing countries:** Georgia, Kenya, Sweden, United Kingdom, United States, Yemen
- **Contributing international organizations:** FAO, OIE, WHO

Five-Year Action Items:

Actions shall be coordinated with FAO, OIE and WHO as relevant international organizations.

1. Emphasize One Health approaches across all relevant sectors of government with the goal of detecting and controlling zoonotic threats while they are still in animal populations. This approach should enhance national ability to meet international standards and improve the quality of human and animal health systems via the WHO IHR Monitoring Framework and the OIE PVS Pathway.
2. Implement joint IHR and PVS training programs for human and animal health services.
3. Increase the compatibility of existing animal and human diagnostics and surveillance data fields, avoiding the creation of new data systems wherever possible.
4. Introduce and advice national multi-sectoral policies and regulatory guidelines promoting poultry and livestock production and marketing practices that minimize the risk of zoonotic disease emergence, including food safety policies and guidelines as well as legislation reinforcing veterinary supervision of the use of antibiotics in animals.
5. Support the implementation of national architecture for real-time bio-surveillance, spanning animal and human populations to support disease monitoring, reporting and analysis via bio-surveillance of high-risk wildlife groups (i.e., birds, bats, etc.)
6. Actively address the proposal of core competencies and systems requirements (e.g., laboratory methods, surveillance data fields) for implementation of the surveillance system.
7. Enhance, link, and increase analytic capability within disease reporting systems (WHO, WAHIS), to ensure that WHO, FAO, and OIE receive pertinent information.

8. Introduce an operational framework that supports multi-sectoral notification for outbreaks of suspected zoonotic origin in the early stage of emergence (prior to efficient human-to-human transmission). The framework should address outbreaks that occur in both animals and humans at a similar time and/or place.
9. Introduce systems that promote complementary research, for public health purposes, and analysis within and across countries for enhanced prevention, detection and response activities for emerging zoonotic diseases.

Baseline Assessment and Planning Activities

1. Use WHO's IHR Monitoring Framework and OIE's PVS Pathways as instruments to identify countries' priorities for strengthening core competencies.
2. Identify core competencies and systems requirements (e.g., laboratory methods, surveillance data fields) necessary for implementation of an operational framework, policies, guidelines and method of surveillance.
3. Determine where it will be possible to enhance surveillance and laboratory diagnostics for selected priority zoonotic diseases to aid in early detection. Such an approach would be preferable to the establishment of new electronic disease surveillance systems.

Monitoring and Evaluation Activities

1. Monitoring activities through Implementation of WHO's IHR Monitoring Framework and the OIE's PVS Pathway.
2. Evaluate the implementation of appropriate One Health policies in national operational frameworks to minimize the risk of zoonotic disease emergence and spread.

GHSA Biosafety and Biosecurity Action Package

(GHSA Action Package Prevent-3)

Five-Year National Target: A whole-of-government national biosafety and biosecurity¹ system is in place, ensuring that especially dangerous pathogens² are identified, held, secured and monitored in a minimal number of facilities according to best practices; biological risk management training and educational outreach are conducted to promote a shared culture of responsibility, 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 are in place as appropriate.

As Measured by: Number of countries who have completed/Completion of a national framework and comprehensive oversight system for pathogen biosafety and biosecurity, strain collections, containment laboratories and monitoring systems that includes identification and storage of national strain collections in a minimal number of facilities.

Desired National Impact: Implementation of a comprehensive, sustainable and legally embedded national oversight program 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, including research, diagnostic and biotechnology facilities. A cadre of biological risk management experts possesses the skillset to train others 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. The transport of infectious substances will also be taken into account.

Country Commitments to Action Package:

- **Leading countries:** Canada, Denmark, Kenya, Peru, Portugal, Spain
- **Contributing countries:** Azerbaijan, Germany, India (*to be confirmed*), Jordan, Republic of Korea, United Kingdom, United States
- **Contributing international organizations:** FAO, IAEA, INTERPOL, OIE, WHO

Five-Year National Action Items:

1. Develop and implement a strategic plan for biosafety and biosecurity.
2. Develop, modernize, enact, and sustain country-specific legislation to support a national program.
3. Develop, implement, and sustain a national oversight program for pathogen biosafety and biosecurity that will incorporate biological risk evaluations of the nation's biological entities; the creation of a legal framework and legal authorities; a multi-sectoral approach; the design and construction of the oversight program; the assessment and establishment of best practices to be put in place in laboratories and facilities; the training of national officials on biological risk evaluation; and existing security arrangements.

¹ Biological Risk Management: The analysis of ways and development of strategies to minimize the likelihood of the occurrence of biorisks (i.e. the probability or chance that a particular adverse event, including accidental infection or unauthorized access, loss, theft, misuse, diversion or intentional release, possibly leading to harm, will occur).

²In this context, especially dangerous pathogens include biological agents and toxins capable of producing significant adverse health and economic effects due to an uncontrolled or intentional release within or outside the laboratory.

4. Establish a new (or mandate an existing) government agency to administer and enforce biosafety and biosecurity oversight systems; creation of the country's list of agents of concern; and development of best practices, information material and tools for government and other entities. Activities should be conducted to ensure that agents are identified, licensed, transported, secured, monitored, and disposed of in a minimum number of facilities with biosafety and biosecurity best practices in place.
5. Integrate field investigation and emergency response capability as an important part of the national program.

Baseline Assessment and Planning Activities

1. Develop a strategic plan—informed by a policy framework and including best practices and model national programs—to guide the development and implementation of a national whole-of-government oversight program for pathogen biosafety and biosecurity.
2. Identify common educational training materials and personnel to be trained as trainers. Implement biological risk management training and educational outreach to promote a shared culture of responsibility, awareness and reduction of dual use biological risks. Develop tools and identify opportunities to assist trainees in implementing new skills at their institutions—or more broadly within their country or region—to train cadres of biological risk management professionals. Conduct national and/or regional training events.
3. Promote sustainable, rapid and culture-free diagnostic methods for biosurveillance as part of biological risk management and support development and training in such methods.
4. Work with other countries to develop a policy development protocol to be used to initiate the development and/or refinement of a national biosafety and biosecurity framework. This protocol will begin with an in-depth issues analysis to explore the following policy considerations: outstanding risks to public health and safety and national security (gap analysis); environmental scan of stakeholder groups and behavior profiling; international comparison; national and state challenges or limitations; social and economic considerations; required controls and authorities; options considered; recommended option for moving forward; and expected impact to stakeholders.
5. Share models, approaches and regional best practices to assist in developing and implementing legally embedded national programs for pathogen biosafety and biosecurity that would address risks posed by a range of activities involving pathogens: possessing, handling, using, producing, storing, permitting access to, transferring, importing, exporting, and releasing or otherwise abandoning. Assistance should include a nationwide assessment of risks in laboratories and facilities by trained biosafety and biosecurity evaluation officials, and where appropriate, biosafety and biosecurity enhancements. Legal authority must be provided to conduct these assessments, to develop elements of the biological risk management oversight program, to train officials in conducting biological risk assessments and identifying mitigating solutions to biological risks, and to implement sustainable programs of bio-risk assessment and oversight.
6. Strengthen and sustain biological risk management best practices with partner countries by training a qualified group of staff members at priority institutions using common educational materials, including biosafety and biosecurity components. Trainings can utilize existing curricula and training models. Newly trained personnel will maintain biological risk management training and training of other trainers with global partners. In-kind contributions will include the provision of expert trainers, materials, and common educational materials.

Monitoring and Evaluation Activities

1. Monitor and evaluate the impact of the national program and provide recommendations for future enhancements.

GHSA Immunization Action Package

(GHSA Action Package Prevent-4)

Five-Year Target: A functioning national vaccine delivery system—with nationwide reach, effective distributions, access for marginalized populations, adequate cold chain, and ongoing quality control—that is able to respond to new disease threats.

As Measured by: At least 90% coverage of the country's fifteen-month-old population with at least one dose of measles-containing vaccine as demonstrated by coverage surveys or administrative data.

Desired Impact: Effective protection through achievement and maintenance of immunization against measles and other epidemic-prone vaccine-preventable diseases (VPDs). Measles immunization is emphasized here because it is widely recognized as a proxy indicator for overall immunization against VPDs. Countries will also identify and target immunization to populations at risk of other epidemic-prone VPDs of national importance (e.g., cholera, Japanese encephalitis, meningococcal disease, typhoid, and yellow fever). In the case of some diseases that are transferable from cattle to humans, such as anthrax and rabies, animal immunization should also be taken into account.

Country Commitments to Action Package:

- **Leading countries:** Italy, Portugal
- **Contributing countries:** India, Pakistan, Republic of Korea, Saudi Arabia, United Arab Emirates, Yemen
- **Contributing international organizations:** FAO, OIE, WHO

Five-Year Action Items:

Actions will be coordinated, as appropriate, with relevant international organizations including FAO, OIE and WHO.

1. Conduct routine immunization activities, focusing on measles coverage of fifteen-month-olds.
2. Establish activities that address immunity gaps for measles and other epidemic-prone VPDs by strengthening routine immunization services and implementing supplementary immunization activities (SIAs).
3. Implement case-based surveillance according to minimum standards.
4. Implement a communication plan to accompany immunization campaigns and practices.
5. Detect and investigate measles and other VPD outbreaks that occur.
6. Provide access to a laboratory in a VPD laboratory network for diagnostic confirmation in order to strengthen capacity for early detection of measles and other epidemic-prone VPDs.
7. Strengthen effective outbreak response immunization for measles and other epidemic-prone VPDs by a) improving capacity to conduct high-quality SIAs, including development and maintenance of detailed and validated microplans, rigorous selection and training of vaccination teams, identification and dissolution of barriers to vaccination within older age groups and vulnerable populations; and b) providing access to vaccine stockpiles.
8. Achieve and document sufficient vaccine production.
9. Achieve and document conduct of safe injection practices.
10. Achieve and document vaccination of health care workers.

Baseline Assessment and Planning Activities

1. Assess and document past and current achievement of national and subnational vaccination coverage targets for measles and other epidemic-prone VPDs by conducting vaccine coverage surveys and serosurveys when appropriate, with an initial focus on measles coverage.
2. Identify barriers to improving efficiencies in the prevention of VPDs (e.g., poor bacteriology capacity, prior antibiotic use, improper specimen collection/handling/transport, lack of standardization of laboratory procedures, barriers to vaccination among older age groups, poor quality control, limited human resources, poor network coordination, poor communications).
3. Identify laboratory capacities necessary to address VPDs, and identify the applicability of using Global Laboratory Network laboratories to respond to emerging infectious diseases with new diagnostics.
4. Work with the Expanded Program on Immunization to identify the applicability of routine immunization in endemic situations and identify gaps.
5. Identify areas of improvement for VPD surveillance components including epidemiology, laboratory, and data management.
6. Identify ways to leverage countries' immunization priorities with regard to the Millennium Development Goals and various GAVI Alliance initiatives.
7. Identify instruments to use (e.g., the new user-friendly tool for district-level measles risk assessment developed by the United States Centers for Disease Control with a grant from the Bill and Melinda Gates Foundation).

Monitoring and Evaluation Activities

1. Conduct appropriate monitoring and evaluation of the implementation and impact of VPD immunization, with an initial focus on 90% measles-containing vaccine (MCV1) coverage and later considering post-introduction evaluations for second dose (MCV2) coverage.

GHSA National Laboratory System Action Package

(GHSA Action Package Detect-1)

Five-Year Target: Real-time biosurveillance with a national laboratory system and effective modern point-of-care and laboratory-based diagnostics.

As Measured by: A nationwide laboratory system able to reliably conduct³ at least five of the 10 core tests⁴ on appropriately identified and collected outbreak specimens transported safely and securely to accredited laboratories⁵ from at least 80 percent of districts in the country.

Desired Impact: Effective use of a nationwide laboratory system capable of safely and accurately detecting and characterizing pathogens causing epidemic disease, including both known and novel threats, from all parts of the country. Expanded deployment, utilization, and sustainment of modern, safe, secure, affordable and appropriate diagnostic tests or devices.

Country Commitments to Action Package:

- **Leading countries:** South Africa, Thailand, United States
- **Contributing countries:** Canada, China, Ethiopia, Finland, Georgia, Israel, Japan, Malaysia, Mexico, Peru, Switzerland, United Kingdom, Yemen
- **Contributing international organizations:** FAO, OIE, WHO

Five-Year Action Items:

Actions will be coordinated, as appropriate, with relevant international organizations including FAO, OIE and WHO.

1. Evaluate capacity needed at national reference, provincial, and district laboratories and implement a five-year approach based on experience with Integrated Disease Surveillance and Response (IDSR) and other ongoing platforms to build capacity at each level.
2. Integrate or increase collaboration among human and animal laboratory systems for a One Health approach.
3. Field-test novel point-of-collection diagnostics appropriate for screening outbreak specimens.
4. Train biomedical engineers in-country to certify biosafety cabinets and repair/maintain general laboratory equipment (centrifuges, fridges, freezers, incubators).
5. Systematically submit microbial samples or isolates to the public health reference laboratory/ies at the regional or national level.

³The laboratory results must be as accurate as possible, all aspects of the laboratory operations must be reliable, and reporting must be timely in order to be useful in a clinical or public health setting. Laboratory quality can be defined as accuracy, reliability and timeliness of reported test results.

⁴The list of 10 core tests in each country includes six testing methods selected according to the IHR immediately notifiable list and the WHO Top Ten Causes of Death in low-income countries: polymerase chain reaction (PCR) testing for Influenza virus; virus culture for poliovirus; serology for HIV; microscopy for mycobacterium tuberculosis; rapid diagnostic testing for plasmodium spp.; and bacterial culture for Salmonella enteritidis serotype Typhi. These six methods are critical to the detection of epidemic-prone and emerging diseases, and competency in these methods is indicated by the successful testing for the specific pathogens listed. The remaining four tests should be selected by the country on the basis of major national public health concerns (see Ijaz et al., "What gets measured gets done. *Emerging Infectious Diseases* July 2012;18:1054-7).

⁵For example, accredited laboratories could be those that have completed appropriate activities according to the Stepwise Laboratory Quality Improvement Process Towards Accreditation (SLIPTA) checklist; the Strengthening Laboratory Management Towards Accreditation (SLMTA) accreditation process; International Organization for Standardization (ISO) standards (e.g., 9001, 15189, and 17025); and/or WHO disease-specific programs (e.g., measles and polio).

6. Establish a laboratory information management system that links with the national disease reporting system.
7. Provide infrastructure improvements, security enhancements, freezers, and a pathogen access control software system to archive and protect collections of dangerous pathogens.
8. Implement step-wise improvement toward accreditation at the district and central levels.
9. Implement basic microbiology training for district-level laboratory technicians, including modules on specimen collection, packaging, transport, and disposal.
10. Identify mechanisms to integrate and sustain national and regional diagnostic capability, including acquisition of reagents and media and access to reference laboratories to support ongoing validation of point-of-care diagnostic tests.

Baseline Assessment and Planning Activities

1. Use WHO's IHR Monitoring Framework and OIE's PVS Pathway (including IHR/PVS laboratory assessment tools) and other appropriate instruments to identify countries' priorities for strengthening core competencies.
2. Identify the five priority test-pathogen combinations to form the basis for nationwide laboratory system strengthening efforts.
3. Determine the level of diagnostic capability practical and needed at each level of the public health hierarchy from national to district.
4. Obtain results from prior laboratory assessments and ensure that future assessments are not conducted unless action will follow.
5. Develop national plans for developing and transitioning diagnostic approaches and training.
6. Map all laboratories in the country with geographic information system (GIS) technology, based on population density and disease burden, and calculate the number of additional testing facilities or specimen referral routes (based on the country's tiered health care system) needed to ensure population access, especially by rural and vulnerable populations, to diagnostic testing and care facilities. Mapping should include laboratory capacities, networks, and partner domains and competencies. Calculate the number of additional strategic sites necessary for storage of rapid tests for priority diseases.
7. Identify existing system vulnerabilities (e.g., laboratory commodity supply chain weaknesses).
8. Develop national protocols to address specimen handling (safe and secure collection, packaging, transport, and disposal), controlled archiving, and import/export procedures. Identify public-private partnerships that could support a more robust specimen transport system and/or use of mobile health technology for laboratory result reporting.
9. Develop a complete toolkit of best practices, guidance, lessons learned and capacity building actions to offer to countries and to contribute to measurable progress.
10. Identify and/or define performance measures, target laboratories for phased improvements, tier-specific testing capacities, and result reporting pathways and identify existing performance measures for laboratory-based disease surveillance.
11. Identify and/or develop appropriate accreditation programs at the district and central levels.
12. Develop a catalog of diagnostics, both currently available and in development, which may be of use to partners interested in incorporating new diagnostic capabilities.

Monitoring and Evaluation Activities

1. Train long-term laboratory assessors and conduct biannual proficiency panel testing on testing capacities defined by tier at each testing site.
2. Conduct proficiency testing for animal diseases with guidance from FAO or OIE reference laboratories.
3. Monitor turn-around time and laboratory result reporting and ensure that they are within defined limits.
4. Review system performance during outbreaks or execute drills to assess performance of system improvements at least biannually.

GHSA Real-Time Surveillance Action Package

(GHSA Action Package Detect-2/3)

Five-Year Target: Strengthened foundational indicator- and event-based surveillance systems that are able to detect events of significance for public health, animal health and health security; improved communication and collaboration across sectors and between sub-national, national and international levels of authority regarding surveillance of events of public health significance; improved country and regional capacity to analyze and link data from and between strengthened, real-time surveillance systems, including interoperable, interconnected electronic reporting systems. This can include epidemiologic, clinical, laboratory, environmental testing, product safety and quality, and bioinformatics data; and advancement in fulfilling the core capacity requirements for surveillance in accordance with the IHR and the OIE standards.

As Measured by: Surveillance for at least three core syndromes⁶ indicative of potential public health emergencies conducted according to international standards.

Desired Impact: A functioning public health surveillance system capable of identifying potential events of concern for public health and health security, and country and regional capacity to analyze and link data from and between strengthened real-time surveillance systems, including interoperable, interconnected electronic reporting systems. Countries will support the use of interoperable, interconnected systems capable of linking and integrating multi-sectoral surveillance data and using resulting information to enhance the capacity to quickly detect and respond to developing biological threats. Foundational capacity is necessary for both indicator-based (including syndromic) surveillance and event-based surveillance, in order to support prevention and control activities and intervention targeting for both established infectious diseases and new and emerging public health threats. Strong surveillance will support the timely recognition of the emergence of relatively rare or previously undescribed pathogens in specific countries.

Country Commitments to Action Package:

- **Leading countries:** Georgia, Norway
- **Contributing countries:** Azerbaijan, Ethiopia, Finland, Indonesia, Israel, Italy, Kenya, Mexico, United Kingdom, United States, Yemen
- **Contributing international organizations:** FAO, OIE, WHO

⁶ Internationally recognized standards for syndromic surveillance are available for the following five syndromes: severe acute respiratory syndrome, acute flaccid paralysis, acute hemorrhagic fever, acute watery diarrhea with dehydration, and jaundice with fever. The three syndromes chosen will depend on national disease control priorities. These surveillance systems should include early warning surveillance data and laboratory findings, which should be analyzed by trained epidemiologists (see Ijaz et al., "What gets measured gets done. *Emerging Infectious Diseases* July 2012; 18:1054-7).

Five-Year Action Items:

Actions will be coordinated, as appropriate, with relevant international organizations including FAO, OIE and WHO.

1. Collaborate with partner countries, FAO, OIE, WHO and other relevant partner organizations to adopt and implement agreed upon standards for surveillance data.
2. Accelerate improvement and implementation of syndrome- and/or event-based surveillance systems, including those related to food and drug safety e.g. through the IDSR framework and guidelines or similar existing programs. Such systems will include opportunities for international or multi-sectoral cooperation.
3. Establish or improve lines of communication with public health laboratories, including reference laboratories at the national and international levels.
4. Establish links to an international reference network for the identification and verification of emerging pathogens that cannot be identified within the country.
5. Strengthen or, if needed, develop surveillance systems that reach across all sectors of government to transmit standardized electronic surveillance data from regional, district, and community levels to a central national hub.
6. Develop the appropriate technical mechanisms to integrate the surveillance data feeds from different sectors for expert analysis and interpretation to benefit decision-makers at relevant levels of government and/or a central national hub.
7. Coordinate event-based surveillance with existing reference microbial laboratory networks as well as WHO IHR notification systems and national focal points, and through notification of OIE listed diseases.
8. Sustain indicator-based surveillance, including syndromic surveillance, and event-based surveillance through training workshops, development of guidelines, provision of expert trainers, materials, and curricula, or other contributions in kind.
9. Contribute to an international framework document for assessment of surveillance systems.
10. Share lessons learned and pool resources on a regional basis for more efficient reporting, investigation and response.
11. Support other countries in the establishment and/or strengthening of national public health surveillance systems as requested by the IHR paragraph 44 and consistent with Article X of the Biological and Toxin Weapons Convention.
12. Collaborate with FAO, OIE and WHO to harmonize standards of reporting, quality of data, and IHR compliance.

Baseline Assessment and Planning Activities

1. Convene a technical discussion with FAO, OIE, WHO and partner countries to develop and implement minimum standards for surveillance data, and review existing tools and systems for surveillance, and promote a common understanding, integration, and interoperability among all relevant sectors of government.
2. Identify gaps in surveillance and diagnostic capacity and develop a national strategy for addressing identified weaknesses.
3. Identify and promote information technology solutions in countries and across regions that strengthen routine and event-based surveillance through timely and accurate data capture, dissemination, and response. Create an inventory of current information technology (IT) systems and work to ensure interoperability among them, ensuring that parallel electronic systems are not created.

4. Determine the prevalence of the 3 core pathogens and of those other pathogens that present as similar syndromes (e.g., acute nonspecific febrile illness) in each major geographical region of the country.
5. Define the epidemiologic objectives/targets for surveillance, develop guidelines and job aids, and train health professionals prior to introducing or amending IT activities.
6. Identify opportunities to utilize existing surveillance guidelines such as the IDSR framework and the WHO's guidelines for implementation of early warning and response.
7. Perform risk assessment.

Monitoring and Evaluation Activities

1. Evaluate effectiveness of surveillance system enhancements.

GHSA Reporting Action Package

(GHSA Action Package Detect-4)

Five-Year Target: Timely and accurate disease reporting according to WHO requirements and consistent coordination with FAO and OIE.

As Measured by: Number of countries trained for reporting of potential public health events of international concern to WHO and to other official reporting systems such as OIE-WAHIS. (and/or) Number of National IHR Focal Points connected to the learning package on reporting to WHO.

Desired Impact: Countries and their National IHR Focal Points, OIE Delegates, and WAHIS National Focal Points will have access to a toolkit of best practices, model procedures, reporting templates, and training materials to facilitate rapid (within 24 hours⁷) notification of events that may constitute a PHEIC to WHO / listed diseases to OIE and will be able to rapidly (within 24/48 hours⁸) respond to communications from these organizations.

Country Commitments to Action Package:

- **Leading countries:** France
- **Contributing countries:** Israel
- **Contributing international organizations:** FAO, OIE, WHO

Five-Year Action Items:

Actions will be coordinated, as appropriate, with relevant international organizations including FAO, OIE and WHO.

Baseline Assessment and Planning Activities

1. Utilize existing data and new technical consultations with WHO, in liaison as appropriate with OIE/FAO, to assess best practices at the national or regional levels, and review barriers that impact the timeliness, accuracy, and transparency of reporting.
2. Develop a toolkit of best practices, model procedures, reporting templates, and training materials, which will include the OIE notification obligations as appropriate and be distributed by WHO to all States Parties to the IHR.

Monitoring and Evaluation Activities

1. Evaluation consistent with the WHO process to assess IHR implementation by State Parties and with the OIE PVS Pathway.

⁷ According to IHR article 6 and OIE Terrestrial Animal Health Code, Chapter 1,1 - Article 1,1,3.

⁸ According to IHR article 10.

GHSA Workforce Development Action Package

(GHSA Action Package Detect-5)

Five-Year Target: A workforce including physicians, veterinarians, biostatisticians, laboratory scientists, farming/livestock professionals, and at least 1 trained field epidemiologist per 200,000 population, who can systematically cooperate to meet relevant IHR and PVS core competencies.

As Measured by: One trained field epidemiologist per 200,000 population, and one trained veterinarian per 400,000 animal units (or per 500,000 population), who can systematically cooperate to meet relevant IHR and PVS core competencies.

Desired Impact: Prevention, detection, and response activities conducted effectively and sustainably by a fully competent, coordinated, evaluated and occupationally diverse multi-sectoral workforce.

Country Commitments to Action Package:

- **Leading countries:** Jordan, Thailand
- **Contributing countries:** Ethiopia, Finland, Saudi Arabia, United States, Yemen
- **Contributing international organizations:** FAO, OIE, WHO

Five-Year Action Items:

Actions will be coordinated, as appropriate, with relevant international organizations including FAO, OIE and WHO.

1. Implement the workforce development strategy and plan.
2. Establish and strengthen rigorous, sustainable training programs for public and veterinary health professionals. Utilizing established ministerial relationships and existing programs such as the Field Epidemiology Training Program (FETP), efforts should emphasize practical, hands-on experience and provide mentorship, guidance, and technical expertise to support Ministry of Health, Ministry of Agriculture and other officials. Areas of competency will include field-based epidemiologic methods (including outbreak investigations, planned epidemiologic studies, and public health surveillance analyses and evaluations), evidence-based decision making, development of effective public health programming, and fulfillment of core IHR and PVS core competencies, leading to the development of timely and effective public health interventions.
3. Strengthen national networks to share resources, scientific data, and best practices and to enhance the country's ability to fulfill relevant IHR and PVS core competencies.
4. Strengthen international and regional networks to share resources (trainers, training material, etc.), scientific data, and best practices with other countries.
5. Foster opportunities for joint investigations, trainings and epidemiological studies among neighboring countries.
6. Foster and expand the public health workforce at the district and provincial levels. Expedite progress on the goal of at least 1 trained field epidemiologist per 200,000 population by expanding basic and intermediate-level FETPs via a tiered approach to produce well-trained public health workers capable of conducting timely outbreak detection and investigation, public health response, and public health surveillance.

Baseline Assessment and Planning Activities

1. Identify and collaborate with partners in the Ministry of Health, Ministry of Agriculture, public health institutes and other relevant local, national, and international entities.
2. Create a workforce development strategy and plan to strengthen all levels of national public health systems and build capacity system-wide and in critical disease-specific programs. The plan should include physicians, veterinarians, biostatisticians, entomologists, and laboratory scientists and feature a budget with identified funding sources. The plan should result in at least one trained field epidemiologist per 200,000 population, capable of using data to prevent, detect and respond to well-known public health threats and emerging infectious diseases of human and animal origin.
3. Establish a Field Epidemiology Training Program.

Monitoring and Evaluation Activities

1. Determine whether a national strategic plan is in place.
2. Monitor the number of trained public and veterinarian health professionals graduating annually from each level (beginner, intermediate, and advanced) of the Field Epidemiology Training Program.
3. Monitor the outputs conducted by participants and programs for quantity (process) measures, impact measures and relevancy to health security.

GHSA Emergency Operations Centers Action Package

(GHSA Action Package Respond-1)

Five-Year Target: Every country will have a public health Emergency Operations Center (EOC) functioning according to minimum common standards;⁹ maintaining trained, functioning, multi-sectoral rapid response teams (RRTs)¹⁰ and “real-time” biosurveillance laboratory networks and information systems;¹¹ and trained EOC staff capable of activating a coordinated emergency response¹² within 120 minutes of the identification of a public health emergency.

As Measured by: Documentation that a public health EOC meeting the above criteria is functioning.

Desired Impact: Effective coordination and improved control of outbreaks as evidenced by shorter times from detection to response and smaller numbers of cases and deaths.

Country Commitments to Action Package:

- **Leading countries:** Malaysia, Turkey
- **Contributing countries:** Ethiopia, Kenya, Saudi Arabia, United Kingdom, Vietnam
- **Contributing international organizations:** FAO, OIE, WHO

Five-Year Action Items:

Actions will be coordinated, as appropriate, with relevant international organizations including FAO, OIE and WHO.

1. Conduct trainings and exercises on GHSA capabilities with regional partners.
2. Establish or upgrade physical space for the national public health EOC to render it immediately accessible to the lead public health authority, with adequate space for a broad multi-sectoral response team; reliable power and communications; and capability to convene participants from ministries and other national and multinational partners as appropriate.
3. Install and train staff on key applications (including but not limited to WebEOC, Red Sky, Dragon Fire, EPI-X, and Epi Info) for use in the national EOC.
4. Designate and train personnel—including technical subject matter experts (e.g., physicians, veterinarians, epidemiologists, microbiologists) as well as support staff—and logistically commit to their rapid deployment as directed by the EOC (e.g., with vehicles and allowances necessary to transport personnel).
5. Develop and field-test distance learning tools to train staff on public health emergency management topics.
6. Develop train-the-trainer capacity and establishment of regional centers for advanced training to sustain and continuously enhance public health emergency management workforce skills.

⁹“Minimum common standards” are defined as emergency management program standards such as the International Organization for Standardization (ISO) 22300 family of standards or national equivalents. WHO’s Emergency Response Framework could also be considered as a source of standards.

¹⁰Rapid response teams (RRTs) are rostered, trained, multidisciplinary teams able to deploy to a public health emergency in any part of the country within 24 hours to investigate and characterize the epidemic, evaluate patients, collect clinical specimens, oversee containment measures, and communicate with public health authorities.

¹¹A “real-time” network or system is one in which information generated by one node in the network or system can be distributed to another node within the network or system within 60 minutes.

¹²“Activating a coordinated emergency response” is defined as conducting a first conference call or meeting including all relevant emergency management sectors and functions (e.g., command/management, operations, planning, logistics, administration/ finance, and communications).

7. Establish One Health Committees with legislative support and cooperation between Ministries of Health and Agriculture.
8. Ensure comprehensive emergency management training for core EOC leadership at the Ministries of Health and Agriculture. In collaboration with other key stakeholders, develop distance learning tools to train staff on public health emergency management topics. With international support, field test tools and sponsor visiting fellows for in-depth public health emergency management training at relevant national and international institutions.
9. Install EOC infrastructure. This will include hardware and software to enable emergency management functions as well as software to enable data collection, analysis, and display.
10. Ensure connectivity to public health surveillance and laboratory information systems in order to facilitate public health response decision making.

Baseline Assessment and Planning Activities

1. Develop an appropriate planning framework.
2. Review national laws and authorities enabling public health emergency management and define the mission of the public health EOC.
3. Identify and establish liaisons with all relevant government ministries.
4. Develop standards for staff competencies, infrastructure, and EOC systems.
5. Develop procedures and protocols for EOC operations.
6. Develop a country sustainability plan for EOC operations.
7. Prepare an inventory of external stakeholders' activities.
8. Convene technical consultations to review best practices, lessons learned, and tools under development for EOC and RRT operations.
9. Conduct national training and exercises to determine performance baselines.
10. Conduct an exercise on GHSA capabilities with regional partners to determine performance baselines.

Monitoring and Evaluation Activities

1. Test the proficiency of personnel—including technical subject matter experts (e.g., physicians, veterinarians, epidemiologists, microbiologists) as well as support staff.
2. Conduct communications exercises between the national EOC and all stakeholders to enhance sharing of public health information.
3. Conduct after action reviews of all exercises and live activations of all EOC and RRT functions, and implement a capacity improvement plan using recommendations from the reviews.

GHSA Linking Public Health with Law and Multisectoral Rapid Response Action Package

(GHSA Action Package Respond-2)

Five-Year Target: In the event of a biological event of suspected or confirmed deliberate origin, a country will be able to conduct a rapid, multi-sectoral response, including the capacity to link public health and law enforcement, and to provide and/or request effective and timely international assistance, including to investigate alleged use events.

As Measured by: Evidence of at least 1 response within 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 memorandum of understanding (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 defense personnel and validation of the MOU through periodic exercises and simulations. In collaboration with FAO, International Criminal Police Organization (INTERPOL), OIE, WHO, individual Biological and Toxin Weapons Convention States Parties (and where appropriate the Implementation Support Unit), the United Nations Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons (UNSGM), and other relevant regional and international organizations as appropriate, countries will develop and implement model systems to conduct and support joint criminal and epidemiological investigations in the event of suspected biological incidents of deliberate origin.

Country Commitments to Action Package:

- **Leading countries:** Republic of Korea, Peru
- **Contributing countries:** Australia, Canada, Indonesia, Israel, Malaysia, Portugal, United Kingdom
- **Contributing International Organizations:** FAO, INTERPOL, OIE, WHO

Five-Year Action Items:

Actions will be coordinated, as appropriate, with relevant international organizations including FAO, OIE and WHO.

1. Establish MOUs or other similar policy frameworks between and among health, agriculture, defense, security and law enforcement sectors at appropriate levels of government, and with relevant regional and international organizations. MOUs will include triggers for information sharing, methods by which information will be shared, guidance for addressing challenges and seeking external assistance, and parameters for joint investigations and interviews.
2. Conduct annual trainings for security, public health, and animal health officials to increase capacity to respond effectively to biological attacks. Ministry of Defense personnel should also join, as they are often key stakeholders in the management of national disasters and emergencies, and international partners with relevant expertise and mandates should be invited to participate.

3. Promote programmes and other assistance packages to help develop national and international capacities to support the building and maintenance of an effective operational capability for the UNSGM, to include i) logistics capabilities, development and testing of protocols and procedures, ii) identification and training for national experts in the diverse range of relevant disciplines required, and iii) helping to build improved and more extensive laboratory analytical capabilities to deal with biological samples (human, animal and plant) that could be collected in an investigation of alleged deliberate use of biological agents.

Baseline Assessment and Planning Activities

1. Identify the relevant ministries or agencies to include the multi-sectoral response in case of biological event of suspected or confirmed deliberate origin.
2. Identify the ministry or agency to conduct criminal investigation and epidemiological investigation, respectively.
3. Review national laws and authorities to select a coordinating ministry or commission
4. Develop procedures and protocols to respond bio-threats including risk communication for experts and general public, rapid response team with on-site rapid testing capacity supporting the development of international capacity to respond to deliberate disease events including Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons (UNSGM).
5. Develop and share a best practices toolkit for training.
6. Conduct a scenario-based exercise (table-top or functional) under supervision of a coordinating ministry or commission.

Monitoring and Evaluation Activities

1. Conduct an annual multi-sectoral table-top or functional exercise with all activities covered under procedures and protocols
2. Review the result of an exercise with higher level government official's attendance.

GHSA Medical Countermeasures and Personnel Deployment Action Package

(GHSA Action Package Respond-3)

Five-Year Target: A national framework for transferring (sending and receiving) medical countermeasures and public health and medical personnel among international partners during public health emergencies.

As Measured by: Evidence of at least 1 response to a public health emergency within the previous year that demonstrates that the country sent or received medical countermeasures and personnel according to written national or international protocols, OR a formal exercise or simulation that demonstrates these things.

Desired Impact: Countries will have the necessary legal and regulatory processes and logistical plans to allow for the rapid cross-border deployment and receipt of public health and medical personnel during emergencies. Regional collaboration will assist countries in overcoming the legal, logistical and regulatory challenges to deployment of public health and medical personnel from one country to another.

Country Commitments to Action Package:

- **Leading countries:** Chile
- **Contributing countries:** Canada, Israel
- **Contributing international organizations:** FAO, OIE, WHO

Five-Year Action Items:

Actions will be coordinated, as appropriate, with relevant international organizations including FAO, OIE and WHO.

1. Establish regional collaboration with other countries and FAO, OIE and WHO regional offices to share information about public health and medical personnel to facilitate cross-border resource deployment during emergencies.
2. Resolve logistical and other problems inhibiting the cross-border deployment of public health and medical personnel during emergencies.

Baseline Assessment and Planning Activities

1. Develop regional toolkits including model liability language or legislation, processes for expediting border crossings during emergencies, and pre-established funding or logistical arrangements to facilitate deployments.
2. Identify ongoing and potential opportunities for and challenges to the cross-border deployment of public health and medical personnel, including legal, logistical and/or regulatory matters.

Monitoring and Evaluation Activities

1. To be determined.