# Public Health Information Services (PHIS) Toolkit

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## Authors

This document was developed by members of the Public Health Information Services (PHIS) Task Team of the Global Health Cluster. Contributors included Nada Abdelmagid (Save the Children), Olivier Le Polain (Public Health England), Francesco Checchi (LSHTM), Boris Pavlin (WHO), and all members of the Global Health Cluster's PHIS Task Team.

## Acronyms

| | |
|---|---|
| CDC | Centers for Disease Control and Prevention |
| DHIS2 | District Health Information System 2 |
| ENA | Emergency Nutrition Assessment |
| EWAR | Early Warning Alert and Response |
| GHC | Global Health Cluster |
| HC | Health Cluster |
| HCC | Health Cluster Coordinator |
| HeRAMS | Health Resources Availability Monitoring System |
| HESPER | Humanitarian Emergency Settings Perceived Needs |
| HMIS | Health Management Information System |
| IASC | Inter-Agency Standing Committee |
| IMO | Information Management Officer |
| IRA | Initial Rapid Assessment |
| MIRA | Multi-Sector Initial Rapid Assessment |
| OIM | Operational Indicator Monitoring |
| PHIS | Public Health Information Services |
| PHO | Public Health Officer |
| PHSA | Public Health Situation Analysis |
| PSD | Preliminary Scenario Definition |
| RHA | Rapid Health Assessment |
| SMART | Standardised Monitoring and Assessment of Relief and Transition |
| SSA | Surveillance System for Attacks on Health Care |

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# Acknowledgements

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# 1. INTRODUCTION

## 1.1 Background

At country and subnational levels, public health information needs are not consistently met by Health Clusters, partly due to short-staffed Health Cluster teams, and multiple and conflicting public health information priorities of different stakeholders. To cope with these challenges, Health Clusters usually attempt to develop local solutions, many of which vary significantly in quality and pose a high workload on Health Cluster teams.

The Global Health Cluster (GHC) is seeking to address these and other public health information challenges through the roll out of the Global Public Health Information Services (PHIS) Standards. These standards are also accompanied by a set of practical tools to simultaneously standardise and support public health information functions at national and sub-national levels.

## 1.2 Purpose of the PHIS Toolkit

This PHIS Toolkit complements the Global PHIS Standards. The Toolkit assembles guidance, templates and best-practice examples for each core, additional and context-specific public health information service, as outlined in the PHIS Standards. It also includes additional general tools and resources to support information management functions in activated Health Clusters or equivalent coordination mechanisms.

## 1.3 Target audience

This toolkit has been developed by the PHIS Task Team of the GHC. Its intended audience consists of:

- Health Cluster Coordinators (HCCs) and Public Health Officers (PHOs), who have to instigate data collection, and interpret and act upon findings;
- Information Management Officers (IMOs); as well as epidemiologists who may be deployed to HCs for specific stand-alone activities), who bear the main burden of designing and executing data collection, management, analysis and reporting; and
- M&E/health program managers in individual GHC partner agencies.

## 1.4 Summary of guidance and applications to support Public Health Information Services

| Domain | Service | Guidance for design/methodology | Data collection tool(s) | Available software /application | Reporting Template(s) | Guidance for interpretation/ use | Other |
|---|---|---|---|---|---|---|---|
| Health Status and Threats for Affected Populations | **Public Health Situation Analysis (PHSA)** | • Public Health Situation Analysis Standard Operating Procedures | • None | Not needed | • PHSA (long-form) template – English<br>• PHSA (short-form) template – English<br>• PHSA (long-form) template – French<br>• PHSA (short-form) template - French | None | n/a |
| | **Rapid Assessment** | **Multi-Sector Initial Rapid Assessment (MIRA)**<br>• Multi-Sector Initial Rapid Assessment (MIRA) Guidance<br>• MIRA Framework | MIRA Investigation Forms | Two applications to facilitate the choice of questions and questionnaire design under development by ACAPS and CDC. | • MIRA Preliminary Scenario Definitions (PSD) Template<br>• MIRA Report Template | None | n/a |
| | | **Initial Rapid Assessment (IRA) Tool**<br>• Guidance Note<br>• Aide Memoire for Field Teams<br>• IRA for Adolescent Sexual and Reproductive Health in Emergency Settings (adjunct to main tool) | • Field Assessment Form<br>• Secondary data template | • Data Entry and Reporting Tool<br>• IRA Software User Guide | • Data Entry and Reporting Tool<br>• IRA Software User Guide | None | n/a |
| | | **Rapid Health Assessment (RHA) Tool**<br>Guidelines and comments | • Field Questionnaire<br>• Data Compilation Template | None | • RHA Report Template | None | n/a |
| | **Humanitarian Emergency Settings Perceived Needs (HESPER) Scale** | The HESPER manual<br>A simplified version for acute emergencies (HESPER light) is being developed and planned for use in 2018. | The HESPER manual<br>Appendix 1: HESPER Scale | None | The HESPER manual<br>Appendix 3: Example HESPER Report | None | The HESPER manual<br>Appendix 2: Training manual for interviewers |

| Domain | Service | Guidance for design/methodology | Data collection tool(s) | Available software /application | Reporting Template(s) | Guidance for interpretation/ use | Other |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | **Early Warning Alert and Response (EWAR)** | • Outbreak surveillance and response in humanitarian emergencies: WHO guidelines for EWARN implementation<br>• Global EWARS Project | Global EWARS Project | Global EWARS Project | Global EWARS Project | Global EWARS Project | n/a |
| | **Population mortality estimation**<br>*(There is no consensus about the method for prospective surveillance or other approaches most appropriate in crises)* | The Standardised Monitoring and Assessment of Relief and Transition (SMART) method | The Standardised Monitoring and Assessment of Relief and Transition (SMART) method *(data to be collected listed in manual but not formatted into a tool)* | ENA (Emergency Nutrition Assessment) software | The Standardised Monitoring and Assessment of Relief and Transition (SMART) method | The Standardised Monitoring and Assessment of Relief and Transition (SMART) method | SMART Capacity Building Toolbox |
| | | The WHO verbal autopsy method (not simplified for crises) | The WHO verbal autopsy method | • The WHO verbal autopsy method<br>• InterVA<br>• SmartVA | None | None | n/a |
| | **Surveillance System for Attacks on Health Care (SSA)** | SSA guidance is in development | | SSA WEB | None | None | Attacks on Health Care |

| Domain | Service | Guidance for design/methodology | Data collection tool(s) | Available software /application | Reporting Template(s) | Guidance for interpretation/ use | Other |
|---|---|---|---|---|---|---|---|
| Health Resources and Availability | **Who, What, Where (3W) matrix** | The GHC is currently developing and piloting a Web App with an accompanying manual for 3Ws. | *(Several context-specific forms are available)* | ReportHub | None | None | n/a |
| | **Partners' List** | None | None | None | No Recommended Template | n/a | n/a |
| | **Health Resources Availability Monitoring System (HeRAMS)** | • HeRAMS user guide: Approach & Roles and Responsibilities of the Cluster<br>• HeRAMS health services checklist | None<br>*(Several context-specific forms are available)* | HeRAMS | None | None | HeRAMS website at WHO |
| Health System Performance | **Health Management Information System (HMIS)**<br>*(no light HMIS option is currently available for emergency settings)* | None | None | None | None | None | Possible options:<br>UNHCR's TWINE in the acute phase<br>DHIS 2 in the protracted phase. |
| | **Vaccination coverage estimation** | • WHO's administrative method for vaccination coverage estimation<br>• WHO's Vaccination | • WHO's Vaccination Coverage Cluster Surveys: Reference Manual Annex H: | WHO is planning the development of standard questionnaires and R/Stata analysis | WHO's Vaccination Coverage Cluster Surveys: Reference | • WHO's Vaccination Coverage Cluster | WHO has launched an e-course: Vaccination |

| Domain | Service | Guidance for design/methodology | Data collection tool(s) | Available software /application | Reporting Template(s) | Guidance for interpretation/ use | Other |
|---|---|---|---|---|---|---|---|
| | *(Existing materials are not designed for emergencies and may need extensive adaptation for difficult contexts with limited data for sample selection)* | Coverage Cluster Surveys: Reference Manual<br>• Vaccine Coverage Post Implementation of a Mass Vaccination Campaign with Oral Cholera Vaccine | Sample survey forms<br>• Vaccine Coverage Post Implementation of a Mass Vaccination Campaign with Oral Cholera Vaccine Appendix 4: Examples of data collection forms | Scripts | Manual | Surveys: Reference Manual<br>• Vaccine Coverage Post Implementation of a Mass Vaccination Campaign with Oral Cholera Vaccine | Coverage Survey Scholar; UNICEF also offers related e-courses |
| | **Operational Indicator Monitoring** | • Global Health Cluster Suggested Set of Core Indicators and Benchmarks by Category<br>• Monitoring Framework under development | Under development | ActivityInfo | None | None | n/a |
| | **Health Cluster Bulletin** | n/a | None | None | Template | None | n/a |
| | **Ad hoc Infographics** | For tables, graphs, diagrams, and dashboards:<br>• Built-in infographic functionalities software/applications (e.g. Word, Excel, Access - ActivityInfo, STATA, SPSS, R, etc…)<br>For GIS:<br>• Comparison of Geographic Information Systems (GIS) software | n/a | For tables, graphs, diagrams, and dashboards:<br>• Built-in infographic functionalities software/applications (e.g. Word, Excel, Access - ActivityInfo, STATA, SPSS, R, etc…)<br>For GIS:<br>• ArcGIS resource manuals | None | None | • ArcGIS Training from Esri<br>• MAPACTION Humanitarian Mapping Training |

| Domain | Service | Guidance for design/methodology | Data collection tool(s) | Available software /application | Reporting Template(s) | Guidance for interpretation/ use | Other |
|---|---|---|---|---|---|---|---|
| | | • ArcGIS resource manuals<br>• QGIS resource manuals<br>• Adobe Illustrator<br>• Adobe InDesign<br>• AMCharts | | • QGIS resource manuals<br>• Adobe Illustrator<br>• Adobe InDesign<br>• AMCharts<br>• Tableau.com<br>• Power BI | | | |
| **Additional Miscellaneous Public Health Information Tools & Resources** | **General Templates for Health Cluster Documents** | n/a | n/a | n/a | • Visual Identity Guidelines<br>• Health Cluster Logo Usage Policy<br>• Letterhead template<br>• Presentation template<br>• Document template | n/a | n/a |

**Table 1: Availability of guidance and applications to support PHIS**

# 2. TOOLS FOR MEASURING THE HEALTH STATUS AND THREATS FOR AFFECTED POPULATIONS

## 2.1 Public Health Situation Analysis (PHSA)

The Public Health Situation Analysis (PHSA) is a background document, which initially synthesises the already available (i.e. secondary) data from a wide array of sources to characterize epidemiologic conditions, existing health needs and possible health threats faced by the crisis-affected population, and is then continuously updated as more information (including from primary data) is gathered. It identifies the major areas for health action to respond to and recover from the crisis at hand. It is relevant for preparedness as well as response planning.

| PHSA Tools | How to use |
|---|---|
| Public Health Situation Analysis Standard Operating Procedures | This **SOP** describes the process of creating a PHSA. It is primarily written with the Cluster Lead Agency in mind. |
| PHSA (short-form) template – English<br>PHSA (short-form) template - French | This is the suggested template for developing the initial PHSA that is undertaken in the first 48-72 hours of a new-onset emergency (English and French versions). |
| PHSA (long-form) template – English<br>PHSA (long-form) template – French | This is the suggested template for developing the more comprehensive PHSA that builds upon the initial PHSA and should be completed within undertaken in the first 14 days of a new-onset emergency and is updated continuously thereafter (English and French versions). |

**Table 2: Public Health Situation Analysis Tools**

Training for PHSA is included in the curriculum for the joint Health Cluster Coordination Training for Health Cluster Coordinators and Information Management Officers. Please refer to this link for updates on up and coming courses: http://www.who.int/health-cluster/capacity-building/training-courses/en/. As of this writing, about 13 countries have PHSAs.

## 2.2 Rapid Assessment

### 2.2.1 Multi-Sector Initial Rapid Assessment (MIRA)

The MIRA is the main inter-cluster approach to joint rapid assessments and is a particularly useful tool in sudden-onset emergencies. MIRA is a methodology; in each situation, customised data collection tools are developed for various methods, such as observations, key informant interviews, focus group discussions, and household surveys. The information is then summarised across sectors, including health. The contribution of the HC to MIRA may vary depending on the scenario and the feasibility of collecting data.

The MIRA Toolbox contains the following:

- Multi-Sector Initial Rapid Assessment (MIRA) Guidance outlines the key steps required, as well as associated roles and responsibilities.
- MIRA Framework asks key questions to inform initial planning. The role of the Health Cluster is to provide health-specific inputs into responses for key questions posed by the MIRA framework. A synthesized PHSA will simplify the process of providing inputs into the MIRA framework.
- MIRA Preliminary Scenario Definitions (PSD) Template is produced within the first 72 hours. The role of the Health Cluster is to provide health-specific inputs into the PSD. A synthesized PHSA will simplify the process of providing inputs into the MIRA PSD.
- MIRA Investigation Forms are generic simplified data collection tools. This template can be used as is, or elaborated/edited by the Health Cluster when providing health-specific inputs into the MIRA design of data collection tools and training of enumerators.
- MIRA Report Template is where all the information collected in the assessment is synthesized into a narrative document. The role of the Health Cluster is to provide health-specific inputs into different sections of the MIRA report. A synthesized PHSA as well as information from the primary data will simplify the process of providing inputs into the MIRA framework.
- Two applications to facilitate the choice of questions and questionnaire design are under development by ACAPS and US Centers for Disease Control and Prevention (CDC).

Since its introduction in 2012, and subsequent revision in 2015, MIRA has been implemented in several emergencies and some reports have been published. A good example of a MIRA report can be found here: Escalation of conflict, Central African Republic, January 2014 (interagency initiative)

**Figure 1: Excerpt from health section of MIRA Report *(Escalation of conflict, Central African Republic, January 2014 (interagency initiative)):***

## SITUATION PRIOR TO THE DECEMBER CRISIS

The already weak health system in the CAR has virtually collapsed. Even before the latest upsurge in violence, the health situation in the country was precarious, with some of the worst health indicators in the region.

Assessments among affected populations indicate that many people are in dire need of health care. Health operational partners are few and coverage is inadequate to meet the needs, with humanitarian aid the sole source of health service provision in the country.

Of the 117 health facilities assessed to date in 8 (out of 16) Health Districts, 50% have been looted, 42% damaged, and 68% have a medicines/supply shortage. It is estimated that 80% of the country's health workers have been displaced. Among the four hospitals in Bangui, three are partially functional.

There is an urgent need to continue to provide other health services such as routine immunization, management of mental and psychological disorders, and to expand and strengthen the technical platform services in health facilities still functional.

It is also necessary to enhance the safety of ambulance service for the collection of victims and the transfer of patients between sites and structures 24h/24h reference in collaboration with international forces.

Communicable diseases are a major concern: malaria is the leading cause of death for children under five years of age and recent surveillance in Bangui shows that malaria cases account for more than 40% of consultations, and there are shortages in anti-malaria drugs in all 22 health districts. Despite this, prevention against malaria remains low, even among the most vulnerable populations: availability of insecticide treated nets (ITNs) in the household (47,2%); children under 5 sleeping under ITNs (36,4%) and pregnant women sleeping under ITNs (40,4%).

CAR has very low immunization coverage (measles vaccine: 55,8%, diphtheria, pertussis and tetanus vaccine : 32,1%)[17] , and with routine vaccinations interrupted for many months, measles epidemics have been ongoing (in November, affecting 15 out of

Table 6: Impact of crisis on healthcare structures, access, capacity and medicine availability
Percentage change in number of structures; percentage of key informants responding affirmatively for access, sufficient capacity and medicine availability

| Site Type | Structures before | Structures after | Reduction in structures | Access to healthcare | Capacity of health services | Medicine availability |
|---|---|---|---|---|---|---|
| Bangui | 4.9 | 2.6 | -47% | 31% | 25% | 5% |
| Urban (non-Bangui) | 1.5 | 1.3 | -12% | 71% | 61% | 54% |
| Rural (axis) | 0.8 | 0.5 | -35% | 37% | 32% | 16% |
| Large village | 0.9 | 0.6 | -37% | 41% | 30% | 13% |
| Small village | 0.7 | 0.5 | -30% | 30% | 35% | 21% |
| **Overall** | 2.0 | 1.2 | **-37%** | **46%** | **39%** | **25%** |

22 health districts). On 31 December 2013, six cases of measles have been confirmed in Bangui, in two IDPs sites. The insufficiency of safe water and sanitation, and overcrowded conditions will increase the risk of diarrheal disease and other waterborne diseases outbreaks such as cholera.

Health needs are the most widespread of all sectors, as the needs are caused or exacerbated by conflict, notably the influx of internal displaced people, war casualties, and seasonal outbreak of disease with high potential epidemics, destruction and looting of health facilities. All reasons have a direct impact on morbidity and mortality. CAR has the world's fifth highest death rate from infectious and parasitic diseases,[18] and the healthcare system is inadequate to respond. CAR is part of the 10 out of 194 countries with the shortest life expectancy (48 years) and of those with the world's worst mortality indicators[19]:

- Infant mortality rate (probability of dying by age one) of 112 per 1,000 live births (2009).
- Under-five mortality rate (probability of dying by age five) of 171 per 1,000 live births (2009).
- Maternal mortality ratio of 850 for 100,000 live births (2008).
- Under-five mortality is due to malaria (28 per cent), pneumonia (17 per cent), diarrhea (14 per cent), prematurity (8 per cent), birth asphyxia (7 per cent), HIV/AIDS (4 per cent), neonatal sepsis (4 per cent), congenital anomalies (1 per cent) and injuries (1 per cent). Other causes represent 15 per cent of deaths.

Priority populations are children under five years of age, women who are pregnant or of childbearing age, people vulnerable to violence and sexual or gender-based violence (SGBV), and people living with HIV/AIDS and other chronic diseases. An estimated 300,000 people between 0–49 years old are living with HIV/AIDS, with the prevalence of HIV infection among adults approximately 15%. Many of these people living with HIV do not have access to the continuity of their antiretroviral treatment.

Priority needs are in immediate and life-saving health care to people affected by difficult or extremely limited access to care,

particularly emergency care (including access to emergency obstetrical care, EmOC), endemic diseases, malnourished children, epidemics and injury from conflict, and complications during childbirth.

Northern prefectures bordering Chad, located in the Sahelian meningitis belt, are the most at risk, but an outbreak of meningococcal meningitis has already affected other parts of the country. The risk of an outbreak of meningococcal meningitis will continue, including the risk of an outbreak linked with serotype A, given that vaccination with the long-lasting conjugate vaccine A (MenAfriVac) has not begun yet in CAR.

## KEY FINDINGS FROM THE MIRA

### Access to health services

Functional health structures have decline from 2 in September to 1.24 on average now. This is a 38% decrease for functional health facilities.

The most important decline is in Bangui, from 5 to 2.61 (a 50% reduction). While there has been limited impact in urban areas outside Bangui (an 11% reduction), a 35% decline has been reported in rural areas where functional health facilities were already scarce.

Overall, the community, through the key informants, reported that access to health services is only at 46%, but with wide disparities: while no before/after data is presented, presumably access to healthcare in Bangui was better than elsewhere before, the current access rate is estimated by key informant at only 26% and in 3rd Arrondissement at 0%, so this represents an enormous change. Conversely, in non-Bangui urban areas, access is estimated at 71%. In rural areas, access is only at 41% in large villages and 30% in small ones – this may well have been the case as well before the recent crisis.

### Geographic variation in access to health structures

There exists a lot of variation by sub-prefecture, with certain areas like Damara and Baoro with no access at all (though this is slightly skewed because no larger urban areas were evaluated in these sub-prefectures), whilst others such as Paoua, Batangafo, Kaga Bandoro, Kabo and Nangha-Boguila reporting good access (>80%)

### Causes of the restricted access to healthcare

Overall, the community informants reported a very wide range of causes that explain restricted access to health care. Lack of medication is the most oft-cited problem, appearing in 36% of communities' top three problems (see Figure 12).

Geographically, the only significant differentiation is cost, which hardly anyone mentioned as being a problem in Ouham but was by far the most significant problem in Nana Mambéré.

Cost is generally a slightly more common problem in urban areas than in rural areas, whereas the lack of medication is more common rural areas.

Lack of security is the biggest problem preventing access to healthcare in Bangui Arrondissements

### Level of functionality of health structures

The overall perceived capacity of currently open health structures to offer basic health services is averaging at 39%, with Bangui is by far the worse at 25% (worse even than rural capacity at 32%).

Non-Bangui urban areas are relatively better off at 61%, although figure is already extremely worrying.

Out of the few currently functional or partly functional health structures, the least commonly provided services are surgery and chronic illnesses while Ante Natal Care (ANC) and vaccination are better covered.

Data again points to a complete collapse of services in Bangui, with vaccination provision and hospitalisation worse than both non-Bangui urban and even rural areas.

### Main health concerns

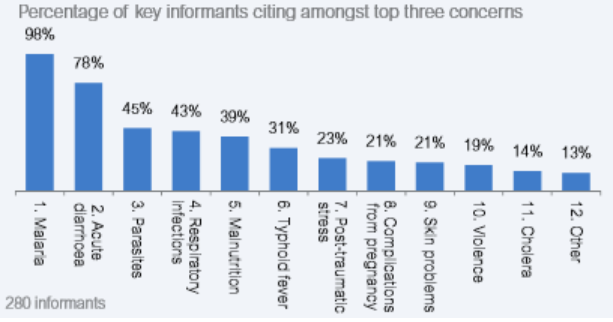
It is no surprise, malaria is the largest health problem reported everywhere, with a score of 9.5 (where 10 represents all people citing it as the biggest problem), followed by diarrhea. Any other diseases is less than half problematic than malaria, without rank weighting, 98% of respondents cited malaria as amongst their top three concerns, and 77% indicated diarrhoea. The next closest with 45% is Parasites.

The order of reported diseases remains largely unchanged regardless of urban/rural or geographical divide, except for Malnutrition (3rd largest problem in Ombella M'Poko and Nana Gribizi, but hardly mentioned in Nana Mambéré).

There is an overall shortage of medicines, with an average 25% coverage of needs. As with capacity and services, Bangui is in the direst situation (averaging at 5% coverage of medicine needs), with rural areas at 16% and a comparably much better situation in other urban areas at 54%.

**Figure 11: Most frequently reported illnesses or medical issues**

Percentage of key informants citing amongst top three concerns




280 informants

### 2.2.2 Initial Rapid Assessment

The two tools described below can be used by the Health Cluster as they are, or adapted to the local context. They can be used when organising and coordinating more in-depth, health-specific rapid assessments, or when supporting individual HC partners with their own local rapid health assessments.

The Inter-Agency Standing Committee (IASC)'s Health, Nutrition & WASH Clusters jointly developed an Initial Rapid Assessment (IRA) Tool. Unlike MIRA which is a methodological approach, IRA is a tool with questionnaires that cover in-depth sectoral information, specifically for health, WASH and nutrition (it covers population's risks as well as health facility assessments).

The IRA toolbox contains the following:

- Guidance Notes
- Field Assessment Form
- Secondary Data Template
- Data Entry and Reporting Tool
- Aide Memoire for Field Teams
- Initial Rapid Assessment for Adolescent Sexual and Reproductive Health in Emergency Settings (adjunct to main tool, developed jointly by Save the Children and UNFPA)

### 2.2.3 Rapid Health Assessment (RHA)

The Global Health Cluster's Rapid Health Assessment Tool (RHA) is a component of the Inter-Cluster Rapid Assessment Tool. It can be used is to be used as part of a multi-cluster assessment or as a stand-alone tool.

The RHA toolbox contains the following:

- Guidelines and Comments
- Field Questionnaire
- Data Compilation Template
- Report Template

An updated methodology and tools for RHA is currently under development.

## 2.3 Humanitarian Emergency Settings Perceived Needs (HESPER) Scale

The Humanitarian Emergency Settings Perceived Needs Scale (HESPER) is a method for assessing intersectoral perceived needs of populations affected by large-scale crises in a valid and reliable manner. It is composed of 26 questions including three on health. HESPER information should complement secondary data and other assessment information in order to compose, and update, the Public Health Situation Analysis and other sectoral analyses.

The HESPER manual includes the HESPER Scale and a detailed explanation of how to use the HESPER Scale, how to train interviewers, and how to organise, analyse and report on a HESPER survey.

Since its introduction in 2011, the HESPER scale has been used 4 times, including among Syrian refugees in Turkey in 2014. It remains the only tool that focuses on what crisis-affected populations perceive as their key needs.

## 2.4 Early Warning Alert and Response (EWAR)

EWAR is a blanket term for the surveillance and response to acute events of public health concern (e.g., outbreaks of epidemic-prone diseases). The EWAR function can be implemented through myriad modalities (sometimes referred to as EWAR Systems, EWARS; or EWAR Networks, EWARN). EWAR should be viewed as a complement to HMIS, with minimal overlap between the two and a different frequency of reporting. The event-based focus of EWAR is data-light and can be implemented rapidly even without indicator-based data reporting. The following tools are available to support EWAR implementation or strengthening:

- Outbreak surveillance and response in humanitarian emergencies: WHO guidelines for EWARN implementation. This guide provides a standard framework and best current practice for implementation of an EWAR following a crisis. These guidelines are intended for all individuals responsible for disease surveillance activities at all levels. The example of Early Warning Disease Surveillance After a Flood Emergency in Pakistan in 2010 shows how the different components of EWAR were implemented.
- The Global EWARS Project is a simple, lightweight electronic EWAR system that can be rapidly configured and deployed to support disease surveillance, alert and response in emergencies. In addition to the application, a start-up kit containing all the hardware needed to launch the EWAR project in-country ("EWARS in a Box"), is available from WHO.

## 2.5 Population Mortality Estimation

There are many methods for conducting mortality estimation in crises, depending on the context and the desired use (advocacy, research, operational planning, etc.). The Standardised Monitoring and Assessment of Relief and Transition (SMART) method enables survey-based estimation of anthropometry, mortality rates and vaccination coverage. It is mainly conceived for fairly simple estimation scenarios. The ENA (Emergency Nutrition Assessment) software supports design, data management and analysis of SMART mortality and anthropometric surveys. Here is an example of using the SMART methodology for mortality assessment from the Food Security and Analysis Unit - Somalia: Guidelines for Emergency Nutrition & Mortality Surveys in Somalia, June 2011.

A manual and automated analysis tool for determining causes of death are available for the WHO's verbal autopsy method, but is not simplified for crises. Analytical tools for cause of death assignment using the data collected by the WHO's verbal autopsy method are InterVA and SmartVA.

## 2.6 Surveillance System for Attacks on Health Care (SSA) (formerly Measuring Violence against Health [MVH])

WHO is currently rolling out a Surveillance System of Attacks on Health Care (SSA). The purpose of the WHO SSA is to systematically collect and make available data on attacks on health care, and their impact on public health, in countries facing emergencies.

The SSA toolbox includes a standard SSA data collection template, a web-enabled secure global database for data entry and generation of automated infographics and reports, and a scoring algorithm for verification of reported attacks.

# 3. TOOLS FOR MEASURING HEALTH RESOURCES AND SERVICES AVAILABILITY

## 3.1 Who, What, Where (3W) Matrix

The 'Who does What, Where?' (3W) matrix systematically maps HC partner activities across the crisis-affected population. The HC-specific 3W Matrix in turn feeds into the all-sector, OCHA-led 3W Matrix. The 4W matrix adds an additional time dimension to the matrix (Who does What, Where and When), to map when and for how long agencies are conducting their activities in the field. In some crises, 5Ws is used, which collects data on beneficiaries under a 'Whom' – this practice is discouraged as it further complicates the data collection for the 3W matrix due to different interpretation of 'beneficiaries' by cluster members.

The 3/4W matrix is the main tool for collection of data from Health Cluster partners. There is no standard Health Cluster template for 3/4W; it is usually developed in-country according to the overall 3W matrix defined by OCHA. It usually includes information similar to that in table 3 below:

| Category | Variable | Values | Meaning |
|---|---|---|---|
| **Who** | Partner | | Agency name or acronym |
| | Partner type | Frontline | The agency is a Health Cluster partner that operates or supports health services at the patient side |
| | | Pipeline | The agency is a Health Cluster partner that enables or supports health service provision, but does not itself operate or support health facilities |
| | | Non-cluster | The agency is not a Health Cluster partner |
| | CERF/CHF recipient? | Yes/No | Whether the partner is a recipient of CHF/CERF funding for health projects. |
| **Where** | Admin level 1 | | District |
| | Admin level 2 | | Sub-district |
| | Admin level 3 | | Camp, village, other specific location |
| **What (frontline health services)** | Community case mgt. | Yes/No | Network of community health workers trained and supplied to manage diarrhoea, ARI, malaria and refer patients as needed |
| | Primary curative | Yes/No | Outpatient curative care for common conditions |
| | EPI | Yes/No | Routine vaccination through the Expanded Programme on Immunization |
| | Mass vaccination | Yes/No | Support to or implementation of mass vaccination campaign(s) |
| | ANC | Yes/No | Antenatal and post-natal care |

| | | | |
|---|---|---|---|
| | BEmONC | Yes/No | Basic emergency obstetric and neonatal care (includes safe birth attendance by skilled personnel) |
| | CEmONC | Yes/No | Comprehensive emergency obstetric and neonatal care (includes Caesarean section and blood transfusion) |
| | HIV | Yes/No | Services for people living with HIV (voluntary counselling and testing, prevention of mother-to-child transmission, and/or antiretroviral treatment) |
| | TB | Yes/No | Testing and at least first-line treatment and follow-up of tuberculosis |
| | SGBV | Yes/No | Clinical management of sexual and gender-based violence |
| | MHPSS | Yes/No | Treatment of and referral for mental health and psychosocial support |
| | Paediatric secondary care | Yes/No | Paediatric ward |
| | General secondary care | Yes/No | General adult ward |
| | Surgery and trauma | Yes/No | Surgical management of trauma injuries |
| | Other (specify) | Yes/No | Any other specific services, e.g. vertical neglected tropical disease programmes, vector control, eye care, etc. |
| **What (pipeline health services)** | Funding | Yes/No | Provision of funding to frontline providers |
| | Drug donations | Yes/No | Donation of kits and other pharmaceutical supplies |
| | Cold chain and vaccines | Yes/No | Provision of cold chain equipment, vaccines and vaccination supplies |
| | Logistics support | Yes/No | Transport of drugs, patients or medical teams; warehousing; other logistics support for frontline providers |
| | Coordination | Yes/No | Health Cluster coordination (national or sub-national) |
| | Health information | Yes/No | Epidemic alert and response, health information on activities, health service functionality, health service performance, etc. |
| | Traning and technical support | Yes/No | Capacity building on specific areas of health service provision, supervision of service quality, creation and dissemination of technical guidelines and policy |
| | Other (specify) | | Any other pipeline health services |

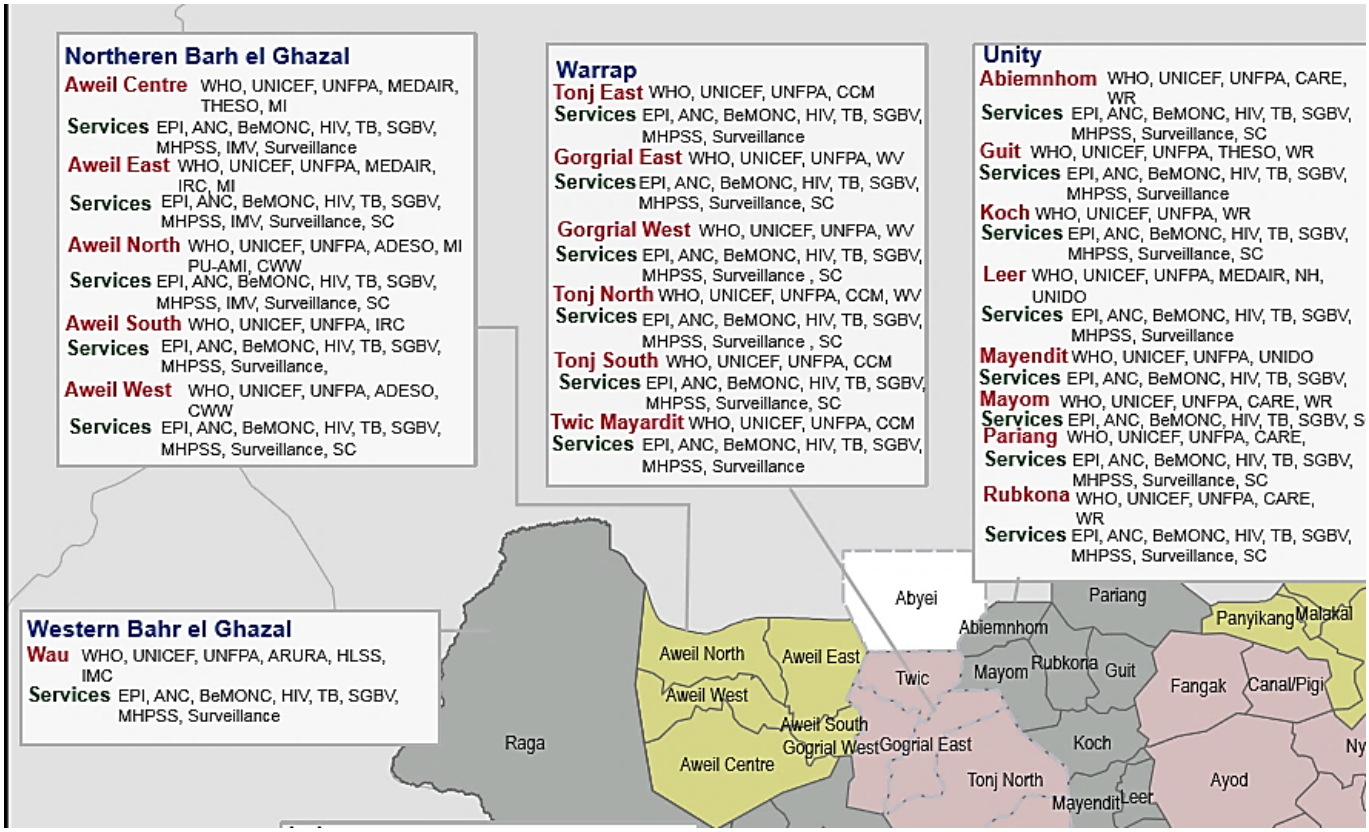
**Table 3: Example of information collected for 3W**

Some clusters are using ReportHub (supported by iMMAP) as their 3/4W reporting tool, including all clusters in Afghanistan, and Health, WASH and Nutrition Clusters in Ethiopia. ReportHub has built-in automated analysis and data visualization features. Once partners submit a report on ReportHub, cluster indicators become available in real-time and are directly linked to UNOCHA's Humanitarian Programme Cycle tools for Humanitarian Response Plan reporting.

Once data are collected and compiled, 3W/4W products such as reports, infographics and maps can be produced.

Many Clusters share their 3/4Ws on humanitarianresponse.info.

**Figure 2: Excerpt from Health Cluster 3W operational presence map *(Conflict, South Sudan, 2017: 3W operational partners' presence)*:**




## 3.2 Partners' List

The Partners' List is a constantly updated database of contact details for HC partners, collected to both facilitate communication among agencies and the work of the HC coordination team.

The main tool here is the partner list template which mainly includes the type of membership in the cluster, contact details and some information on partner operations and capacities (but does not duplicate information in the 3Ws or HeRAMS).

There is no standard template for partner lists, but it usually includes the following information:

| Agency | Focal point name | Focal point designation/job title | Focal point email address | Focal point telephone number | Date of last update to information |
|---|---|---|---|---|---|
| | | | | | |

**Table 4: Example of information collected for partner's list**

Examples of partner lists are:

- Cyclone, Fiji, 2016
- Nigeria: Health sector Partners Contact List

Many Clusters share their Partner Lists on humanitarianresponse.info.

## 3.3 Health Resources and Services Availability Monitoring System (HeRAMS)

The Health Resources and Services Availability Monitoring System (HeRAMS) is designed to systematically monitor the availability of health services to affected populations. It maps all health delivery points within the crisis-affected area.

The following tools are available to support HeRAMS implementation or strengthening:

- HeRAMS user guide: Approach & Roles and Responsibilities of the Cluster. This guide describes the rationale of HeRAMS, the data levels and requirements and the methodology.
- HeRAMS health services checklist. This document describes the key health services to be delivered at community, mobile, primary, secondary and tertiary levels. The document acts as a checklist for the services expected at the different levels of care. It is an essential tool when developing the localised design and data collection materials for HeRAMS in-country.

An online tool has been developed for HeRAMS and is currently hosted by WHO's HeRAMS platform. More information on this HeRAMS online tool can be found in this flyer.

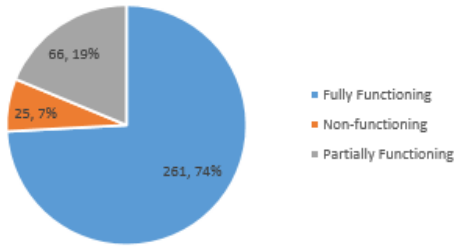
**Figure 3: Excerpt from HeRAMS Report *(Conflict, Syria 2016: Annual HeRAMS Report (Turkey Hub) – 3rd Quarter 2016 Snapshot for Public Health Centres in Syria (WHO Syria Country Office))*:**

## 2. Functionality status

Functionality has been assessed at three levels: **fully functioning** which mean open and providing full package of essential services, **partially functioning** means open but not providing the full package of essential services, or **not functioning**. Out of 327 assessed health facilities, **74% (261)** were reported fully functioning, **19% (66)** partially functioning, **7% (25)** out of service, this result in **26%** of the facilities are non-functioning or partially functioning with low capacity. See Figure 2.

**56%** of the non-functioning health facilities were hospitals.

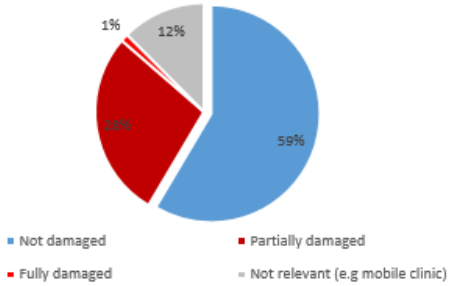
**Figure 2. Functinality status of Health facilities**




## 3. Condition of health facilities infrastructure

The condition of the health facilities infrastructure has been assessed at three levels: **fully damaged**: major damage requiring complete reconstruction, **partially damaged**: requiring substantial to large scale repair, and **not damaged**, **29% (102)** health facilities were reported damaged [**1%** fully damaged and **28%** partially damaged], **59% (215)** were reported intact, while **12% (44)** of health facilities were not relevant to evaluate. See figure 3.

**Figure 3 Level of Damage**




**Trend analysis** of functionality status of public health centres from 2014 to 2016 is presented in Figure 2. The total number of non-functional health centres in 3rd quarter 2016 still high (**548**) compared to 3rd quarter 2015 (**468**).

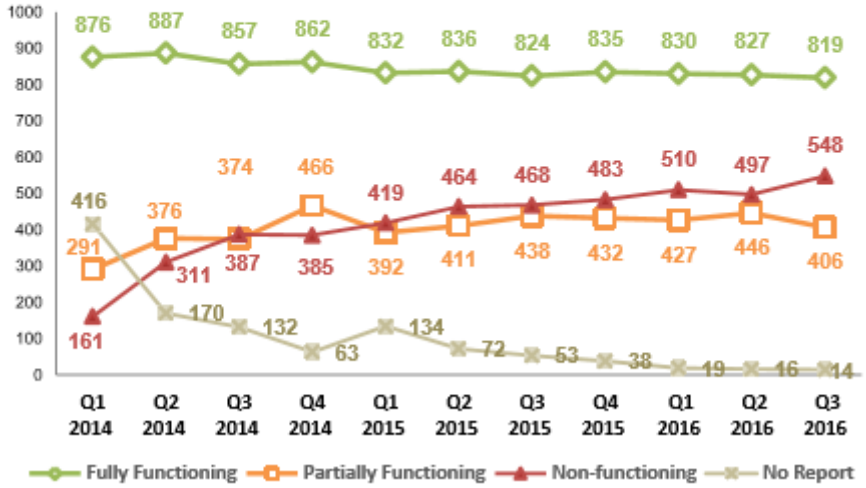
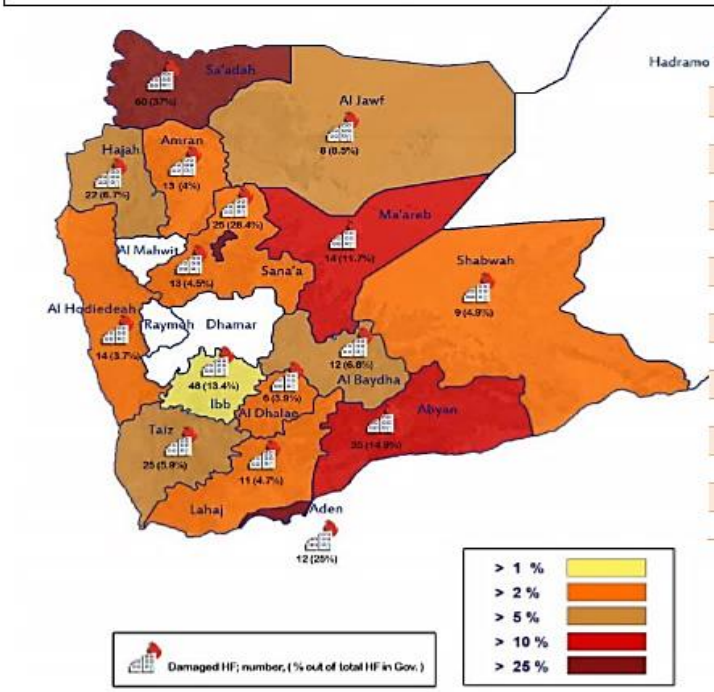


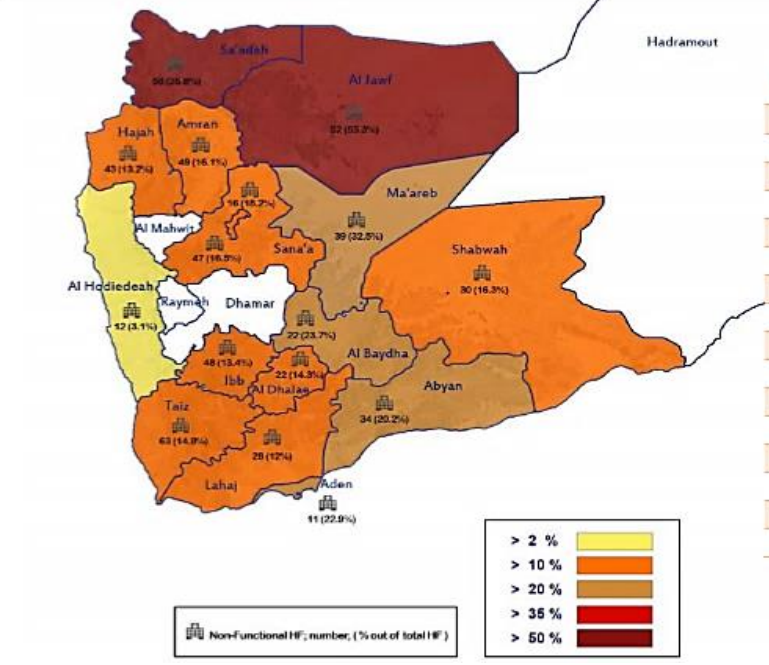
**Figure 4: Excerpt from HeRAMS Report *(Conflict, Yemen, 2016: Service Availability and Health Facilities Functionality in 16 Governorates):***

- The level of damage to the health facilities has been measured in terms of either; **fully damaged, partially damaged** (parts of the infrastucture have been damaged) and **not damaged** (building is intact).
- **The total** number **of totally damaged health facilities is 69** whereas those that are **partially damaged are 205 HF.**
- Damages in each governorate are shown in the map below; the color gradient changes based on their percentage from the total HF.




| No | Governorate | Total HF | Totally Damaged | Partially Damaged | Total | % out of total |
|---|---|---|---|---|---|---|
| 1 | Sa'adah | 163 | 24 | 36 | 60 | 37.0% |
| 2 | Al Amana | 86 | 1 | 24 | 25 | 28.4% |
| 3 | Aden | 45 | 1 | 11 | 12 | 25.0% |
| 4 | Abyan | 168 | 8 | 17 | 25 | 14.9% |
| 5 | Ma'areb | 120 | 5 | 9 | 14 | 11.7% |
| 6 | Al Jawf | 94 | 1 | 7 | 8 | 8.5% |
| 7 | Al Baydha | 177 | 4 | 8 | 12 | 6.8% |
| 8 | Hajah | 326 | 6 | 16 | 22 | 6.7% |
| 9 | Taiz | 425 | 7 | 18 | 25 | 5.9% |
| 10 | Shabwa | 184 | 2 | 7 | 9 | 4.9% |
| 11 | Lahaj | 234 | 4 | 7 | 11 | 4.7% |
| 12 | Sana'a | 285 | 2 | 11 | 13 | 4.6% |
| 13 | Amran | 304 | 1 | 12 | 13 | 4.0% |
| 14 | Al Dhalae | 155 | 1 | 5 | 6 | 3.9% |
| 15 | Hodeida | 384 | 2 | 12 | 14 | 3.7% |
| 16 | Ibb | 365 | 0 | 5 | 5 | 1.4% |

- Functionality of health facilities is categorized / defined as follows: **Fully functional:** the health facility is open and provides healthcare services at full capacity. **Partially functional**: health facility is operational but with partial capacity due to shortages in staffing, supplies, equipments or due to damages to infrastructure. **Not functional;** the health facility is not providing any services due to any of the following reasons: damages, lack of essenital operational inputs of staff and funds, inaccessibility due to insecurity or the facility is not yet operational.
- **Out of total 3507 health facilities; 1,579 (554%) were reported to be fully functional and accessible, 1,343 (38%) were partially functional and 504 (17%) not functional.** The map below shows the number of **non-functional health facilities** in each governorate followed by its % out of the total HF.




| No | Governorate | Fully functional | Partially functional | Total | % out of total HF |
|---|---|---|---|---|---|
| 1 | Hodeida | 178 | 192 | 370 | 96.9% |
| 2 | Lahaj | 176 | 30 | 206 | 88.0% |
| 3 | Hajah | 196 | 87 | 283 | 86.8% |
| 4 | Ibb | 156 | 153 | 309 | 86.6% |
| 5 | Al Dhalae | 32 | 100 | 132 | 85.7% |
| 6 | Taiz | 124 | 238 | 362 | 85.2% |
| 7 | Amran | 187 | 68 | 255 | 83.9% |
| 8 | Shabwa | 106 | 48 | 154 | 83.7% |
| 9 | Sana'a | 167 | 70 | 237 | 83.5% |
| 10 | Al Amana | 54 | 18 | 72 | 81.8% |
| 11 | Abyan | 73 | 61 | 134 | 79.8% |
| 12 | Aden | 34 | 3 | 37 | 77.1% |
| 13 | Al Baydha | 33 | 102 | 135 | 76.3% |
| 14 | Ma'areb | 17 | 64 | 81 | 67.5% |
| 15 | Sa'adah | 38 | 66 | 104 | 64.2% |
| 16 | Al Jawf | 8 | 34 | 42 | 44.7% |

7

# 4. TOOLS FOR MEASURING HEALTH SYSTEM PERFORMANCE

## 4.1 Health Management Information System (HMIS)

A Health Management Information System (HMIS) collects, analyses and reports data from health providers and facilities on causes of consultation and hospitalisation, services and patient clinical outcomes. The role of the HC is usually to support and improve existing HMIS in-country, and harmonise the different HMIS implemented by HC partners, by introducing a common set of indicators, data collection instruments and procedures, health facility datasets, catchment population assumptions, software application, etc.… In rare occasions where there is no existing HMIS in-country, the HC should support local health authorities and HC partners in setting up an HMIS.

The most widely used HMIS in most crisis-affected countries is District Health Information Software 2 (DHIS 2). This data analytics and management platform is completely web-based and has built-in visualization and analysis features. Extensive guidance on tools needed to implement and support DHIS2 operations can be found here. As DHIS 2 can be resource-intensive to implement, development of a lighter version for crisis settings is under discussion.

In acute crises, UNHCR's TWINE is a possible existing option, and works especially well in camp and urban settings. Generic forms and complete guidance for roll-out is available on the website.

## 4.2 Vaccination Coverage Estimation

Vaccination coverage is a key indicator to evaluate the performance of vaccination services, assess the risk of epidemics, and to establish whether and what remedial vaccination activities are needed.

The WHO's administrative method for vaccination coverage estimation manual describes how administrative coverage can be calculated using data available from routine EPI monitoring data. This estimation method is in contrast to the survey method below, which directly measures vaccination coverage in a representative sample.

| Community name | Compilation of immunization coverage data for the previous 12 months | | | | | | | Analysis of problem | | | | | | Prioritize – highest number of penta3 unimmunized children is #1, and so on |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Annual target population | Doses of vaccine administered | | | Immunization coverage (%) | | | Unimmunised (number) | | Dropout rates (%) | | Identified problems | | |
| | Children ≤1 year of age | penta1 | penta3 | MCV1 | penta1 (c/b)*100 | penta3 (d/b)*100 | MCV1 (e/b)*100 | penta3 (b-d) | MCV1 (b-j) | penta1 - penta3 (c-d)/c*100 | penta1 - MCV1 (c-e)/c*100 | Access (good, poor) | Utilisation (good, poor) | |
| a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
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**Figure 5: Calculation of administrative vaccination coverage using routine EPI data**

The WHO's Vaccination Coverage Cluster Surveys: Reference Manual covers the design of the sampling frame, planning and implementing the fieldwork, data entry, cleaning, and management, tabulations and analyses, as well as interpretation, formatting, and sharing results.

In addition, a separate set of guidelines exists for Vaccine Coverage Post Implementation of a Mass Vaccination Campaign with Oral Cholera Vaccine, and follows a similar cluster sampling method as outlined in the Reference Manual above.

**Figure 6: Excerpt from Vaccination Coverage Report (Conflict/Cholera Outbreak, Iraq, 2015):**

OCV Coverage

Among the 5,007 respondents from the 10 governorates, 87% reported 2-dose OCV coverage, and 7% reported 1-dose coverage (Table 2). Two-dose coverage was similar among male (86%) and female (88%) respondents and among age groups: 85% among children 1–4 years of age, 89% among children 5–14 years of age, and 87% among persons ≥15 years of age (Table 2). When vaccination coverage was stratified by sex and age group, the lowest 2-dose coverage was among boys 1–4 years of age (83%) and the highest was among girls 5–14 years of age (89%). OCV campaign vaccination cards were available for 79% of persons who reported being fully vaccinated; these cards indicated that 47% had received 2 doses, and 32% had received 1 dose. Among the respondents who reported receiving 2 doses, 27% had only 1 dose recorded on their vaccination cards. Among the respondents who reported receiving OCV, 90% reported receiving the vaccine at their residential structure, 6% at a health facility, 3% at school, and 1% at a market.

Two-dose OCV coverage in the northern governorates (91%) was higher than that in the southern and central governorates (80%), and 1-dose coverage in the northern governorates (6%) was lower than that in the southern and central governorates (10%) (Table 3). Among the northern governorates, 2-dose OCV vaccination coverage ranged from 90% in Dahuk to 93% in Erbil and Sulaymaniya; however, greater variability was seen between the southern and central governorates, where 2-dose coverage ranged from 21% in Babil to 98% in Anbar (Figure; Table 3).

Reasons for Not Being Vaccinated

The 2 most common reasons for not receiving vaccine during the first or second OCV vaccination round were being absent during the campaign (first round 35%, second round 39%) and teams not visiting the respondents' residential structures (first round 30%, second round 36%) (Table 4). Other reasons for not being vaccinated during the first round were unavailability of vaccine (11%), lack of faith in the vaccine (4%), and being sick during the campaign (3%). The reasons for not being vaccinated during the second round were similar: unavailability of vaccine (2%), sick during the campaign (9%), and absence of the decision-maker at home at the time of the vaccinators' visit (5%). In the 3 governorates with the lowest coverage (Baghdad Karkh, Kerbala, and Babil), 46% of respondents stated vaccination teams did not visit their residential structure, and 22% stated they were absent during the campaign.

WHO has launched a learning initiative aimed at epidemiologists and statisticians interested in leading or supporting vaccination coverage surveys, the Vaccination Coverage Survey Scholar. Those interested are encouraged to regularly check the WHO Immunization M&E webpage as well as TechNet-21 for future course announcements as well as to access material on vaccination coverage surveys. UNICEF also offers related e-courses.

Other tools under development include software with standard code for analysing immunization survey data, training materials and methods, a step-by-step guide to survey implementation, and a discussion paper on defining the role of coverage surveys.

## 4.3 Operational Indicator Monitoring

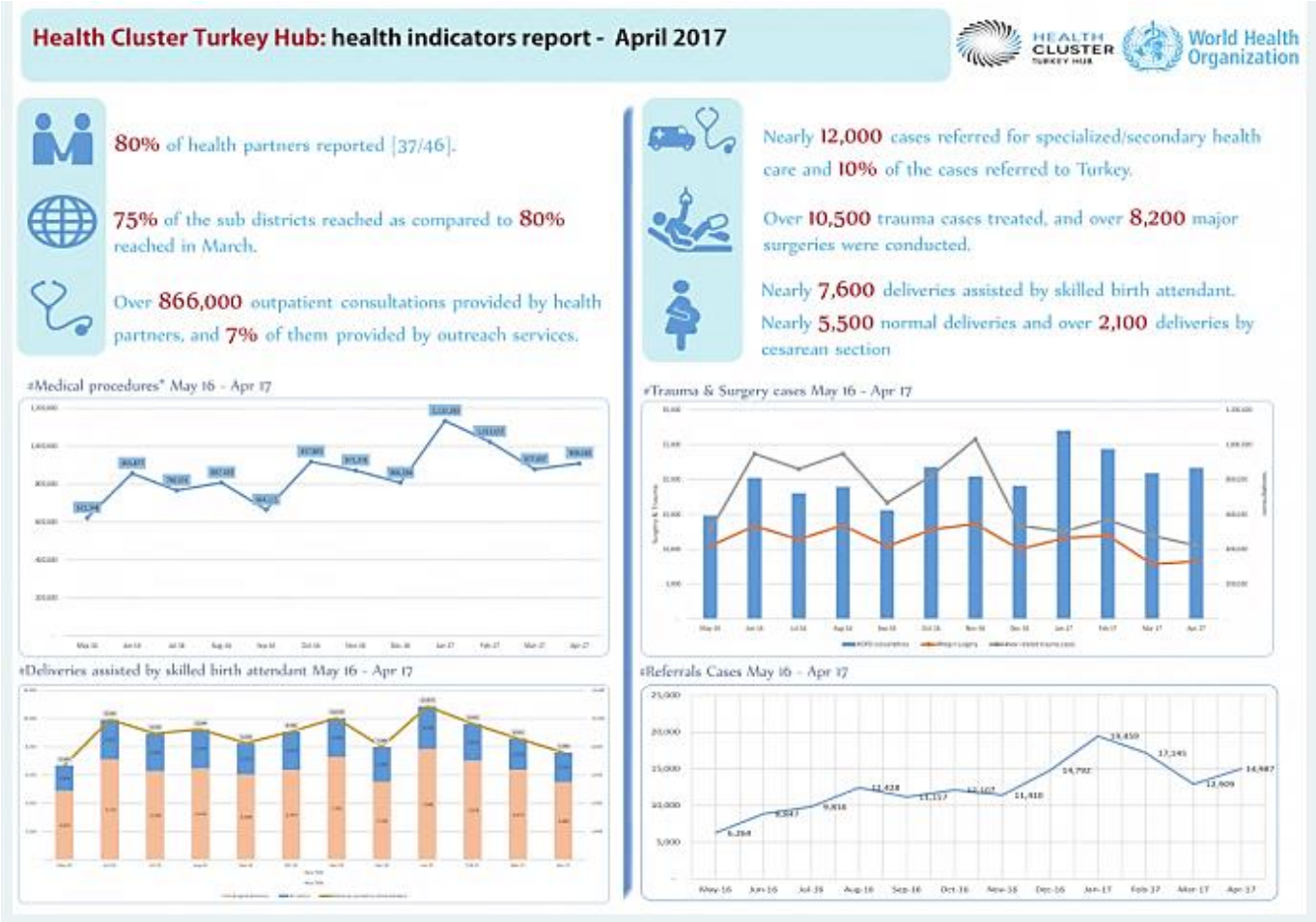
The Operational Indicator Monitoring (OIM) service aggregates and reports a small set of key performance indicators for the HC response as a whole. OIM captures data generated by HC partners and other systems, e.g. HMIS (see above). The process for doing so is necessarily different in every HC, depending on available data sources. A framework for capturing core and supplementary OIM indicators, and a software platform to do so, are under development. One currently commonly used platform for OIM is the ActivityInfo Monitoring & Evaluation software for humanitarian operations.

Below are some of useful tools to support the process:

- Global Health Cluster Suggested Set of Core Indicators and Benchmarks by Category : an excerpt from the Health Cluster Guide
- Indicators Registry: The indicators listed in the registry have been developed by the global clusters. It is recommended to adopt and use the indicators listed as 'key' to allow comparison of needs and response monitoring across countries

After data collection and analysis, various products using OIM information can be generated.

**Figure 7: Excerpt from Health Indicators Report *(Conflict, Syria, 2017: Health indicators report - April 2017)*:**



## 4.4 Health Cluster Bulletin

The Health Cluster Bulletin is a frequent publication that provides an overview of the main public health needs, key health information including trends, and activities of HC partners. The Health Cluster Bulletin's purpose is mainly to keep all HC partners and other stakeholders informed of Health Cluster activities.

A typical Health Cluster Bulletin should have the following structure:

- cover page with title, crisis name, reporting period, HC partners and observers;
- highlights of the previous time period (since publication of the last bulletin);
- information from health assessments during the time period;
- information from different surveillance / monitoring systems during the time period;
- summary needs and gaps during the time period;
- information about/from coordination meetings during the time period;
- agency activities during the time period;
- capacity building during the time period;
- funds requested and received during the time period;
- useful contact details, including key staff at national and/or at each sub-national level where the humanitarian activities are ongoing

The Health Cluster Bulletin template can be found here.

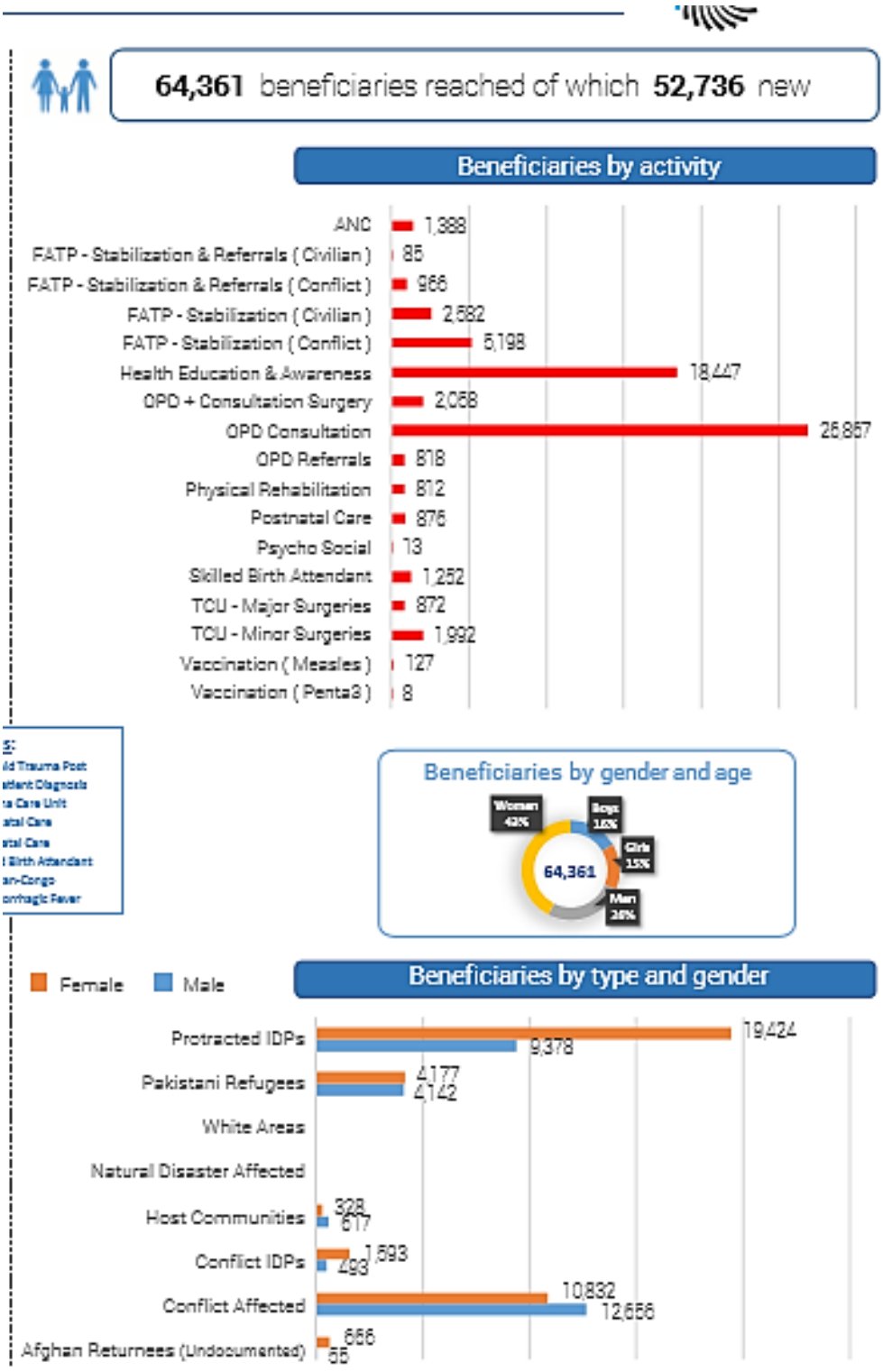
## 4.5 Ad hoc Infographics

Infographics are typically commissioned by the HCC or prepared by an IMO to complement and help illustrate information arising from other public health information services, e.g. the PHSA, a HC Bulletin, or a HeRAMS report. Occasionally, they may be presented as a standalone information product, or included in presentations for various audiences. Infographics for PHIS can include tables, graphs, diagrams, dashboards or maps.

- Tools for tables, graphs, diagrams, and dashboards:
  - Automated/built-in infographic functionalities of word processing, spreadsheet and database management software/applications (e.g. Microsoft's Word, Excel, Access).
  - Automated/built in infographic functionalities of data collection, analysis and reporting software (e.g. ActivityInfo, STATA, SPSS, R, etc…)
- Tools for maps:
  - ArcGIS (proprietary) with resource manuals
  - QGIS (open-access) with resource manuals
  - ArcGIS Training from Esri
  - MAPACTION Humanitarian Mapping Training

A comparison of commonly used mapping tools can be found here.

**Figure 8: Excerpt from Health Cluster Dashboard *(Conflict, Afghanistan, 2017)*:**



# 5. MISCELLANOUS PUBLIC HEALTH INFORMATION TOOLS & RESOURCES

## 5.1 General Templates

The GHC has developed branding guidelines and general templates for Health Cluster products. These include:

- Health Cluster Visual Identity Guidelines
- Health Cluster Logo Usage Policy
- Health Cluster letterhead template (Word)
- Health Cluster presentation template (PowerPoint)
- Health Cluster document template (Word)

## 5.2 Other Resources

Here are some miscellaneous tools that may be of use to PHIS functions in activated clusters.

- Field Guide for the Use of Geo-Codes: provides an overview of the use of geographic coding (known as geo-codes) or position codes (known as P-codes), which define unique identification numbers for areas and facilities.