



# Briefing on WHO Tools and Guidance on Immunization Data Quality and Vaccination Coverage Survey

Summary Report

Istanbul, Turkey | 1-4 December 2015



World Health  
Organization

## Executive Summary

From 1 to 4 December 2015, 68 representatives of Ministries of Health, National Statistics Offices and national institutes from five regions of the World Health Organisation (WHO), UNICEF, scientific institutions, independent consultants, non-governmental organisations and partners met in Istanbul, Turkey, with the objective to

- 1) Present new tools developed by WHO on immunization data quality and the new *Vaccination Coverage Cluster Survey Reference Manual*
- 2) Train participants, including potential consultants or academic or similar organizations able to provide technical assistance, on one of the following tracks:
  - immunization data quality and
  - vaccination coverage survey planning and implementation.

In recent years, the importance of using high quality data both to improve immunization programme performance and to monitor the results has been highlighted, for example following the roll-out and annual assessments of the Global Vaccine Action Plan (GVAP). Also, *Gavi, the Vaccine Alliance*, now requires countries applying for all types of Gavi support to conduct:

- an annual desk review of immunization data
- periodic in-depth assessments of routine administrative vaccination coverage data and
- periodic nationally representative vaccination coverage surveys.

Given this background, over the next few years, it is expected that there will be an increased need for guidance and technical assistance to assess the quality of country immunization data and produce actionable data improvement plans, as well as to implement vaccination coverage surveys using the revised [\*WHO Vaccination Coverage Cluster Survey Reference Manual\*](#).

This Briefing was the first of such activities and aimed at sharing the new materials and tools, seeking expert advice to complete those materials related to data quality, sharing best practices among participants and thinking critically about the design of a vaccination coverage survey in a given country, from survey protocol design, to implementation and interpretation of results.

## Participants

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## Partners

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## Session Highlights

### Introductions

The meeting agenda included plenary sessions for all participants to hear from and discuss with presenters on key topics and steps forward, as well as two separate tracks:

- 1) immunization data quality and
- 2) vaccination coverage surveys

In the immunization data quality track, the draft WHO guidance document on this topic (“Data Quality Review”) was presented and the four main areas of this methodology – systems assessment, desk review, field review and improvement planning – were discussed.

In the vaccination coverage survey track, the new *WHO Vaccination Coverage Cluster Survey Reference Manual*, published as a working draft in 2015 by WHO headquarters, was presented and discussed using a 17 steps model (see diagram on page 10) and exemplified by the case study of a coverage survey to be conducted in an imaginary country.

### Welcome remarks

*(Marta Gacic Dobo, WHO HQ)*

Immunization data quality is a global priority. All 194 Member States of WHO have signed up for the ambitious goals of the Global Vaccine Action Plan (GVAP). Monitoring progress and providing accountability will be key for tracking and reaching the goals included in the GVAP as well as in the regional and national action plans. Recently, Gavi, the Vaccine Alliance, introduced new data quality requirements which include annual “desk reviews” and periodic data quality assessments as well as coverage surveys. To answer these needs, WHO – together with partners – are developing a set of tools to address the necessity for better data. The purpose of this meeting is to brief participants on these tools and to gain input from participants for further improvement and rollout of the materials to Member States.

### Setting the stage

*(Jan Grevendonk, WHO HQ)*

Immunization coverage is measured to monitor performance and strengthen immunization systems. There are two complementary methods to assess immunization coverage:

- 1) coverage evaluation surveys conducted in households and
- 2) administrative reporting systems where data is obtained from registers and compared to population estimates.

Immunization managers should use data for managerial action, that is to identify priority areas or population groups with limited access to the services, to monitor progress over time and find reasons for poor performance. At the same time, immunization data is used to enhance accountability at higher national levels, international agencies, partners and the population. Data is of “good” quality if it contributes to a complete, unambiguous, meaningful and correct inference of the status of an

immunization system which allows managers to take timely actions to optimize the performance and impact of the programme. In this context, administrative data needs to be systematically examined in order to assess their quality and adequate for use for programme management. This can be done through standalone assessments or through immunization dashboards, which are powerful tools whereby data can be used for management action. This data can include information on stock-outs, cold chain status, adverse events following immunization, coverage trends over time, etc. WHO's aim is to encourage Member States to also use survey data for system strengthening and programme management. Therefore, administrative data quality improvement strategies and coverage surveys should go hand in hand.

### **Supporting improvements to immunization data availability and quality: GAVI perspective**

*(Lora Shimp, John Snow, Inc, on behalf of Gavi as a member of the Gavi 2015 Data Quality Working Group.)*

Gavi, the Vaccine Alliance, aims at improving the availability, quality and use of immunization data with a focus on data quality requirements. Data quality will be a Strategic Focus Area in Gavi's 2016-2020 strategy. The requirements allowing for evidence-based planning and systematic monitoring will include data quality improvement plans, annual desk reviews, periodic in-depth system assessments and periodic nationally representative surveys. The data should be used to make adjustments in the quality and performance of immunization services in the countries. The rational is to look holistically around needs assessment ("Where are the problems?"), solution & planning ("How to make the improvements sustainable?"), implementation (country ownership and alignment with partners' support) as well as monitoring & learning (in order to document results, lessons learned and reinforce improvement plans). If possible, existing methodologies for data assessment and data collection systems should be used. Through the Partners Engagement Framework (PEF) as part of Gavi's 2016-2020 strategy, an opportunity will be given to partners to help provide technical support targeted towards data quality monitoring and strengthening, to enable countries to identify more specific needs and to engage technical institutes and experts. The Joint Appraisal (JA) is an annual grant monitoring activity for all Gavi-eligible countries which should be used strategically to identify countries' needs for data quality monitoring and improvement and to facilitate technical and financial support to fill the gap. Through these measures, countries are encouraged to strategically use Gavi funds for improving immunization data availability, quality, monitoring and use.

### **Data quality**

*(Jan Grevendonk, WHO HQ)*

WHO believes that data is a tool for Member States to improve their public health systems and programmes. Data should be critically analysed regularly and, most importantly, used for action. Several countries have conducted in-depth data quality assessments using the Immunization Data Quality Audit (DQA) and the Immunization Data Quality Self-Assessment (DQS), two methodologies which are already available. In recent years, however, questions on system design, reporting burden, duplicate reporting and parallel reporting flows, as well as the need for an annual systematic desk review methodology have gained attention. In this workshop, methods and protocols will be refined and it will be

built upon existing methods and tools to create a common framework for desk reviews of immunization data and in-depth periodic reviews. The proposed data quality review should contain four steps:

- 1) national level systems assessment (system design, tools in use, human resources needed, etc.)
- 2) national level desk review (regarding timeliness and completeness, internal consistency, time trends and triangulation with external data such as coverage surveys)
- 3) field review of systems and data (in health centres and along the reporting chain) and
- 4) improvement planning.

## Vaccination coverage surveys

(Carolina Danovaro, WHO HQ)

In 2015, WHO published the working draft of the updated *Immunization Coverage Cluster Survey Reference Manual*. Since the release of the first *Coverage Cluster Survey Manual* in the 1980s, the vaccination landscape has changed dramatically: New and more expensive vaccines have been introduced, different age groups are being targeted and strategies (such as routine services and campaigns) have diversified. Surveys can help to identify trends in coverage levels, provide possible explanations to situations of low coverage, delayed vaccinations, missed opportunities or absent immunization cards. They serve as a complement to coverage data obtained from administrative systems. The updated WHO coverage cluster survey methodology aims at improving survey precision, accuracy, documentation and overall quality through the minimization of biases. Moreover, countries are encouraged to use the results for action while highlighting its limitations. Main enhancements are, amongst others:

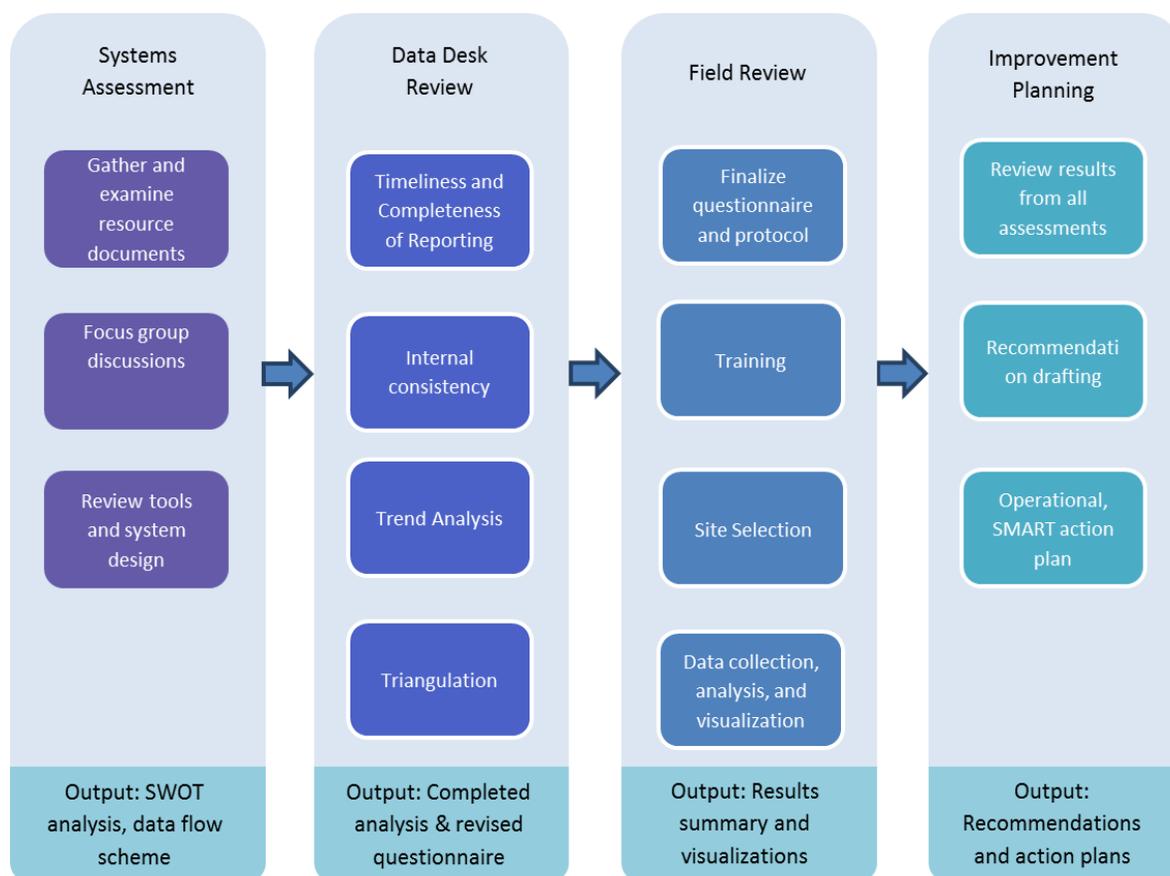
- emphasis on survey goals (estimation vs. hypothesis testing vs. classification) and corresponding sample size calculation
- use of probability sampling to allow strong claim of representativeness and meaningful confidence intervals
- pre-selected households to be interviewed in order to limit opportunities for field data collectors to influence selection
- documented outcome of visits to each household so that missing data can be accounted for properly
- weighted statistical analyses
- easy inclusion of multiple age cohorts (2<sup>nd</sup> year of life, HPV)
- more documented data on vaccination status: Health facilities are visited to search registers in addition to cards
- emphasis on using results for action
- “organ pipe plots” and “inchworm plots” as advanced methods to illustrate results.

Expected challenges include the possible necessity of larger sample sizes if precise subnational coverage estimates are sought, costly technology for data capture, more technical assistance required (statistician, maps, information and communication technology), sophisticated microplanning, amongst others. As next steps, experiences with the updated manual in practice will be documented and shared and, ultimately, influence further revisions. Moreover, trainings and e-learning modules are planned for 2016 and beyond while experiences in Member States will continue to accumulate.

## Data Quality Track

### Ideas, proposed changes, and lessons learned

During the data quality track meetings, the upcoming WHO guidance on vaccination data quality was presented to participants. The review process will be comprised of four main parts: National level systems assessment, national level data desk review, field review of systems and data, and improvement planning, as illustrated below:



### Systems review

First, reviewers need to try and gain a full understanding of the information system they will evaluate. This can be achieved through interviews, focus-group discussions, or a desk review of previous reports, forms and tools. Discussion focused on the design of reporting tools and on the implication of parallel reporting flows for data quality. Participants raised the need for more structured guidance from WHO around both areas.

### Data desk review

The discussions around data reviews were structured as exercises, using a training data set, around 4 main areas of review: reporting completeness and timeliness, internal consistency of data, analysis of trends in

numerators and denominators, and triangulation with external data sources. 6 groups each analysed the training data set, and presented the conclusions in plenary. Some takeaways included:

- Completeness and timeliness of reporting should be tracked at every level, not only at the central level for district or regional reports. Districts should track completeness and timeliness of health facility reports and other reporting documents as well. Electronic systems should have standard reports to report on completeness and timeliness at each level.
- Data should further be checked for internal inconsistencies. When electronic systems are available, automated queries may be used to automatically search for repeats or duplicates and data ending in 0's and 5's.
- Participants agreed that longer term trend analysis of both the numerator and denominator is instructive to understand data quality problems with either. This is an underused practice, and particularly, people are not necessarily taking into account the effect of adjusted denominators when evaluating coverage.
- Other underused data are the estimates that are obtained through coverage surveys. The importance of triangulation of administrative and survey data was highlighted, also in routine practices. Triangulation may include the comparison of administrative coverage data with survey data (where confidence intervals should be given), surveillance data (and, in that case, also with vaccine quality data) and stock management data.

It was also recommended that key players should determine the goal of data quality exercises *a priori*.

As next steps, participants called for example visualizations to be embedded within the guidance document in an annex/Excel file and for bolstering the linking of the results of a desk review to specific improvement plans (such as National Comprehensive Multi-Year Strategic Plans, annual plans, etc.).

## Field review

It was emphasized that the questionnaires in field reviews should contain both qualitative and quantitative questions allowing for a mix of both types. Within the questionnaire, however, more options or categorized answers should be included to guide the answer to a few areas. Participants asked WHO to include an example questionnaire in the guidance document on data quality field review. In the health facility review, categorical questions should be included (e.g. “Have you been adequately trained?”) and categorized by time period, topic, etc. Data verification should be adapted to specific age groups and may be done with a monitoring chart. For the site selection process, participants suggested to adapt the justification and methodology from the existing Data Quality Self-Assessment (DQS). More in general, participants raised the following points:

- DQS has been proven useful, and this update to the methodology should build on it, rather than replace it.
- Different stakeholders such as experts on Health Management Information System (HMIS) and the National Bureau of Statistics (NBS) should be consulted.
- The desire for more “step-by-step”, prescriptive guidance on the process.

## Improvement plan

A general framework for developing improvement plans based on the findings from the desk and field reviews was proposed. The following discussion broadly focused on:

*Increased visibility through existing national EPI plans:* Participants called for the integration of the data quality improvement plan with other, existing plans such as annual plans and National Comprehensive Multi-Year Strategic Plans (cMYPs). cMYPs should have at least a short component or paragraph on data quality strategies; annual plans should have operational, specific data quality action points or plans that should be updated every year based on the annual desk review. According to the participants, the latter is especially critical for securing ownership at the higher levels. Participants recognized that actions to address data quality challenges need to go beyond data managers, given the often political nature of these challenges.

*Further refinement of the guidance document:* Participants agreed that the number recommendations should be limited so that they are manageable. It was also mentioned that stated recommendations should be SMART<sup>1</sup>, and stratified according to current and additional resources. In addition, it was mentioned that the table in the improvement plan section should include action plans that go beyond recommendations. The data quality indicators at the end of the document should be revised. The question of “How do we link this into the recommendations and action plan?” if a certain indicator is flagged as poorly-performing should be addressed in the guidance document.

*The need for robust training methodology and material, plus capacity-building:* A training methodology should be developed to make sure that adequately trained personnel is available for drafting recommendations based on the tables in the guidance document, including guidelines for training of trainers, training material for regional workshops, training offered at local public health institutions, etc. The question was raised whether a model for the Training of Mid-Level Managers (MLM) or Immunization in Practice (IIP) would be helpful. Furthermore, the need for strong working group of M&E and data management focal points at country level, or data quality “champions,” to drive this process during Data Quality Reviews (DQRs) was highlighted. This group should include experts from national institutes of statistics, public health institutes, and health programmes such as EPI. It was proposed that training may be provided through regional workshops and other training material which needs to be developed.

*Operational research on past review methodologies:* Generally, it was agreed that WHO’s new methodology on data quality review should be based on and justified by operational research on what has worked and not worked in the Data Quality Self-Assessment (DQS). Participants expressed their wish to have examples of best practices, lessons learned and case studies included in the upcoming guidance document.

## Resources

The draft guidance document is available through the meeting Dropbox® (see page 13).

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<sup>1</sup> SMART: Specific – target a specific area for improvement; Measurable – quantify or at least suggest an indicator of progress; Assignable – specify who will do it; Realistic – state what results can realistically be achieved, given available resources; and Time-related – specify when the result(s) can be achieved.

## Coverage Survey Track

### 17 steps to conduct a coverage survey

During the Istanbul briefing, the updated *WHO Vaccination Coverage Cluster Survey Reference Manual* was presented to the group and discussed. The briefing was structured along 17 steps to conduct a coverage survey as described in the manual:



It was highlighted before and during the group exercises that this proposed timeline has no binding but instead a demonstrative character as, according to the needs and possibilities, every survey project can take a slightly different development. For example, while some steps may be taken simultaneously, others may highly depend on each other's completion.

### Briefing sessions

The first session of the coverage survey track dealt with the differences between the previous *WHO Coverage Cluster Survey Manual* and the current version and introduced the latter's innovative features. During the "key steps" exercise, participants learned about traps and pitfalls around survey consideration, planning, implementation and action taking. The variety of roles needed for a successful survey was recognized. Also, it was emphasized that, in some steps, the support by a statistician may be essential.

In the second session, steps 1-3 were presented and discussed. Herein, participants learned about the primary considerations when contemplating a coverage survey, and acquired the capability to describe the qualifications for members of a steering group, to determine the primary questions for a survey and to set inferential goals. Furthermore, one central issue of this session was the calculation of the sample size. Related to this, participants discussed common activities and decisions that drive the survey sample size, thus its cost/budget and timeline.

During the briefing, participants had the opportunity to apply and test their knowledge and skills to a case study, a coverage cluster survey project in the fictitious country of “Harmonia”. The goal of this exercise was to become familiar with the new manual, to think critically about the design of a vaccination coverage survey in a given country and to be capable to skilfully advise national authorities on survey protocol design, survey implementation, interpretation of results (and their limitations) and review of a final survey report.

In the third session of this track, steps 4-11 were discussed. The overall learning objectives of this session were to develop a survey schedule, to identify the uses for a proposal (also known as concept note), to develop a proposal and then a full protocol, to recognize the necessary mechanisms to secure funding, to complete a Request for Proposal (RFP) for survey implementation and to seek ethical approvals. Moreover, the standard data collection tools (e.g. household listing, outcome of each visit, etc.) were explained and participants were advised on their selection, evaluation, use and modification. More sophisticated technical considerations related to the utilization of Information and Communication Technology (ICT) such as mobile computer devices (e.g. tablets) or digital photography for data collection were also addressed. Finally, the group talked about the advantages of a true probability sample, the household selection process, key staff roles and possible challenges in coordinating survey logistics.

Steps 12-15 were presented in the following session while an emphasis was put on training, data collection and data management (database design, data entry, data cleaning, merging datasets, and constructing derived variables) including the management of photographic files.

The importance of the codebook and weighted analysis was stressed in step 16 (“Analyzing Data”) and step 17 (“Interpreting & Sharing the Results”). In addition, terms such as “point estimate” and “uncertainty” were discussed and new tools – namely “inchworm” and “organ pipe” plots – were introduced. It was mentioned that draft survey reports should be critically reviewed and recommendations for action should be based on the survey results given. Participants were also trained to recognize survey limitations based on the final report.

In the last two sessions of the coverage survey track, variations in survey design and purpose were brought up for discussion and the novelties of the updated *WHO Coverage Cluster Survey Reference Manual* were summarized. A “Question and Answer” session was added to day 3 in order to address outstanding questions posted by the participants on a space dedicated to collect questions. Similarly, on the last day, a working breakfast with a survey statistician was organized for participants interested in learning more about some sampling and analytical issues.

## Online resources

The updated *WHO Coverage Cluster Survey Reference Manual* can be found on WHO’s website:

 [http://www.who.int/immunization/monitoring\\_surveillance/en/](http://www.who.int/immunization/monitoring_surveillance/en/)

 [Working Draft – New WHO Vaccination Coverage Cluster Survey Manual](#)

 [Working Draft – New WHO Vaccination Coverage Cluster Survey Manual - Annexes](#)

## Final Considerations

### Immunization dashboards

*(Jan Grevendonk, WHO HQ)*

Dashboards are innovative tools to enable immunization managers to display, analyze and make use of immunization data. During this session, participants divided into topical groups and brainstormed key indicators that must be included on a routine immunization dashboard for programme management. The five topics were:

- Coverage
- Secondary evaluation (i.e. surveys)
- Supply chain management
- Vaccine-Preventable Disease surveillance and Adverse Events Following Immunization
- Data Quality

On dashboards, coverage levels can easily be monitored, short and long term trends highlighted, under-performing regions and districts flagged, access and dropout issues shown, un-immunized and under-immunized groups of children identified, trends in immunization activities detected and inequities illustrated. What regards programme management data, the following data may be shown, amongst others: Stock availability at service level, stocked according to plan, closed vial wastage, forecasted demand ratio, on-time and in-full delivery, temperature alarms and functional status of cold chain equipment. Furthermore, dashboards allow for various checks on completeness and timeliness to address the issue of data quality. During the final discussions, participants called for customization of dashboards to individual users, with different job descriptions and at different levels of the health system. WHO was asked to provide process guidance to indicate what should be done once the indication on a dashboard show a problem. Feedback and generated ideas from this session will be used by WHO to generate a more detailed guidance on core indicators regarding the above aspects of immunization programmes.

### Meeting conclusions

The meeting was concluded with final remarks and acknowledgements from Marta Gacic-Dobo. She emphasized the importance of the work on improving data quality from the ground up and the appropriate use of quality surveys.

### Workshop evaluation

The quality of the briefing was monitored throughout and the organizing team conducted daily debriefings to make adjustments to the agenda and/or material as required. Surveys collecting suggestions for improvement and participants` expected actions post-workshop were also completed by all participants. Overall, the briefing was well evaluated with questions such as “How well did the briefing meet its objectives?”; “How useful were the plenary for doing your job?”; “How useful were the specific track sessions [data quality and survey] for doing your job?”; and “How was the logistical support?” scoring >4 in a 1 to 5 scale.

## Next steps

Follow-up regional and subregional workshops on data quality and the new WHO Vaccination Coverage Cluster Survey are envisioned. WHO guidance documents on data quality review, the use of immunization data and functional standards for electronic immunization records are expected to be published throughout 2016. Similarly, it is expected that the Survey Manual will be officially published in 2017, following a final revision informed by field experiences and lessons learned from using the Manual in upcoming surveys for routine immunization as well as for post-supplementary immunization activities (SIAs).

All participants are highly encouraged to become member of the meeting Dropbox® to access the presentations and meeting documents as well as other useful material. Invitations can be obtained by sending a short request to [who.immunization.meeting.2015@gmail.com](mailto:who.immunization.meeting.2015@gmail.com).

Going forward, participants are also invited to connect to ongoing work by signing up to the user group around immunization information systems on Technet-21 (<http://www.technet-21.org/>), the Technical Network for Strengthening Immunization Services. In particular, all participants are highly encouraged to use the Technet-21 Resource Library (<http://www.technet-21.org/en/resources/technet-resource-library>) to find reports, documents, guidance, journal articles, presentations, etc. on a broad range of vaccination topics such as ICT and immunization, data quality or coverage surveys.

## Links

-  Technet-21 in English: <http://www.technet-21.org/en>
-  Technet-21 in French: <http://www.technet-21.org/fr>
-  Technet-21 in Spanish: <http://www.technet-21.org/es>
-  Technet-21 Resource Library: <http://www.technet-21.org/en/resources/technet-resource-library>
-  Technet-21 User Group around Immunization Information Systems: [http://technet-21.org/index.php?option=com\\_easysocial&view=dashboard&type=group&groupId=154:immunization-information-systems&Itemid=507&lang=en](http://technet-21.org/index.php?option=com_easysocial&view=dashboard&type=group&groupId=154:immunization-information-systems&Itemid=507&lang=en) (please sign up for a Technet-21 account first)