TRIANGULATION FOR IMPROVED DECISION-MAKING IN IMMUNIZATION PROGRAMMES

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World Health Organization, UNICEF, and

U.S. Centers for Disease Control and Prevention

Acknowledgments

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Feedback can be addressed to EPItriangulation@gmail.com

Orientation to this Guide

1.   Introduction

Triangulation is the synthesis of two or more existing data sources to address relevant questions for programme planning and decision-making. Triangulation can include assembling the data together in one graph or stitching information from several graphs together with a narrative thread. Triangulation requires critical thinking and some basic analysis skills, but the activity goes beyond making graphs — it's about turning data into reliable information for action.

Even in the absence of perfect data, public health practice has long acknowledged that combining many pieces of weaker evidence through triangulation can form a strong basis for more informed decision-making. Through the use of multiple data sources, the process identifies and addresses the limitations of any one data source and/or data collection methodology. A more complete view of the programme issue can be obtained by making sense of complementary information and integrating knowledge of the broader context.

2.   Objectives of this Guide

Triangulation can be used by immunization and vaccine preventable disease (VPD) surveillance programmes to address key questions to guide management, tailor strategies, and make decisions to achieve goals. This guidance provides a systematic approach to using triangulation for programme improvement. To achieve success, the analyst's critical thinking and creative input are key. Within this context, **the main objectives of this triangulation guide** are as follows:

»» To **increase knowledge and understanding** related to triangulation among immunization programme and VPD surveillance managers at the national and subnational levels;
»» To **provide a triangulation process** for developing questions, identifying data sources, and interpret different data together considering underlying context and limitations;
»» To **provide examples** of how triangulation can be used for programme improvement;
»» To **provide guidance and resources for implementing data triangulation** and building data triangulation capacity within countries.

3.   Document Structure and Target Audience

The triangulation guide is **structured for the national and subnational levels**. For both levels, there are separate documents for general triangulation guidance and annexes that provide specific triangulation guidance for key topics: immunity gaps; programme performance; and programme targets (denominators) (Fig 2). The content and focus of these documents are described in Table 1.

The **target audience** for the national guidance documents are immunization and VPD surveillance programme staff at the national, regional or provincial levels. The subnational guidance documents have been developed to orient staff to triangulation for key programme questions at the district or health facility levels (Fig 2). These guides may also be useful for non-governmental organizations providing programmatic and technical assistance to national immunization and/or VPD surveillance programmes.

Fig. 2. Structure of Triangulation Guidance. National guidance targeted for national & regional/provincial levels; subnational for district/facility levels.

Audience		Document
All	**0.**	Cover & Orientation to Guide
National	**1.**	General Triangulation Guidance
		Topic Specific Annexes
	2.	Immunity gaps
	3.	Programme performance
	4.	Programme targets (denominators)
Sub-national	**5.**	General Triangulation Guidance
		Topic Specific Annexes
	6.	Immunity gaps
	7.	Programme performance
	8.	Programme targets (denominators)

Triangulation is relevant for most contexts and a variety of different applications. To achieve success in triangulation (i.e., conducting analysis, incorporating into tools and processes, and building capacity) requires **adaptation to local context**. Materials to support capacity building are available by request at: EPItriangulation@gmail.com.

Table 1. Content and examples of questions covered in triangulation guidance by level

Document	National level	Sub-national level
General guidance	In-depth introduction to triangulation principles and the 10-step process Hints on choosing questions, identifying data sources, visualizing and interpreting data	Fundamental introduction to triangulation and the 4-step process Hints on choosing questions, identifying data sources, summarizing data
Immunity gaps: Annex	In-depth examples of triangulation to identify immunity gaps *Are there any age groups, geographic areas, high-risk populations with immunity gaps?*	Basic examples of triangulation to identify immunity gaps *Do the data suggest there are immunization coverage gaps?*
Programme performance: Annex	In-depth examples of triangulation to assess programme performance *Is coverage compatible with other measures of programme performance and impact?*	Basic examples of triangulation to assess programme performance *Which health units have poor performance or data quality issues requiring follow-up?*
Programme targets: Annex	In-depth examples of triangulation to assess programme targets (denominators) *Do immunization target population estimates align with known demographic trends?*	Basic examples of triangulation to assess programme targets (denominators) *Do programme targets accurately capture everyone in the catchment area?*

4. How the Guide was Developed

The use of triangulation to check data quality (i.e., external consistency) has been described in the WHO *Data Quality Review* (DQR) toolkit.[1] The current triangulation guide builds upon the DQR desk review and adapts the 'public health triangulation' process from the global HIV/AIDS programmes[2] as general best practices for data analysis across broad topics relevant for EPI.

This guide was developed based on evidence from a landscape review; experiences of triangulation use in countries; and feedback from a Technical Consultation on Data Triangulation, the SAGE Data Working Group, and other immunization experts. It has been shared during Immunization Data Partners' Meeting (2018), a WHO Scholar Course, as well as regional and country-level workshops, and feedback from various participants has been considered. For further reading, a *Public Health Data Triangulation for Immunization and Vaccine-preventable Disease Surveillance Programmes: Draft Framework* is available online.[2]

Triangulation guidance has been incorporated into the Gavi *Analysis Guidance* (2020), available in English, Spanish, French and Russian,[3] and the WHO *Handbook on the use, collection, and improvement of immunization data* (March 2020 draft). These resources may also be helpful.

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[1] World Health Organization (WHO). Data Quality Review. Geneva: WHO; 2017 [Available from: http://www.who.int/healthinfo/tools_data_analysis/dqr_modules/en/.
[2] WHO, UNICEF and U.S. Centers for Disease Control and Prevention. Public Health Data Triangulation for Immunization and Vaccine-Preventable Disease Surveillance Programmes: Framework (draft). 2019. https://www.learning.foundation/vpd-triangulation-draft
[3] Gavi, the Vaccine Alliance. Analysis Guidance (2020). https://www.gavi.org/our-support/guidelines/report-and-renew