

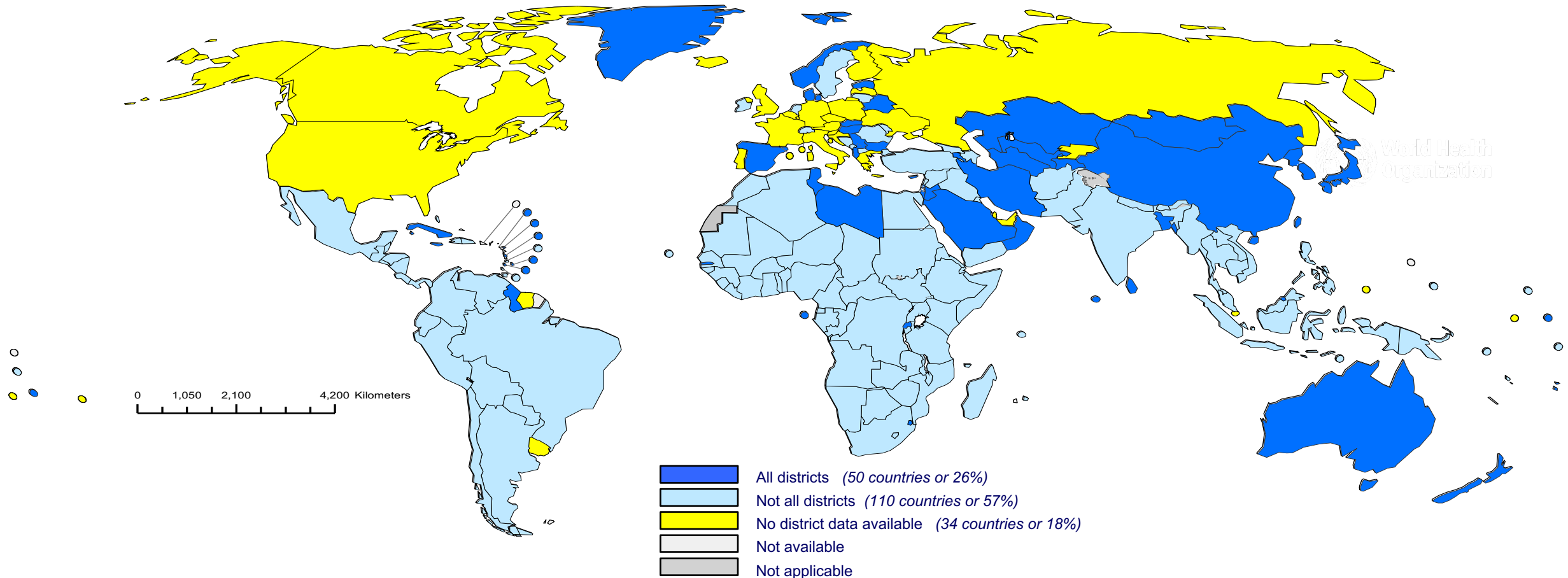
Mapping of Global Immunization Programme Data: Gaps and Opportunities

Immunization programme data needed to identify potential 'hotspots'



	Ideal Programmatic data needed	Current programmatic data available
Coverage	<ul style="list-style-type: none">• Accurate and timely programme coverage data• Disaggregated data to identify unprotected population• Ability to heat-map to specific locations/groups of unimmunized	<ul style="list-style-type: none">• National and sub-national data of variable quality• Equity data from surveys (i.e. urban, rural, wealth quantile, ethnicity)• Data is annual from administrative system or less frequent by survey (every 3-4 years)
Surveillance	<ul style="list-style-type: none">• Standard case definitions• Surveillance that is both sensitive and specific (usually case-based)• Lab confirmation that allows for decision making• Timely data	<ul style="list-style-type: none">• Variability in case definitions used• Mostly aggregated data reported annually• Case based data for polio and measles reported weekly / monthly• Some laboratory data
Implementation of Policy	<ul style="list-style-type: none">• Policies fully implemented and monitored	<ul style="list-style-type: none">• Variable implementation

Countries with all districts achieving at least 80% DTP3 coverage, 2017



Source¹: WHO/IVB Database, as at 27 June 2018. Map production: Immunization Vaccines and Biologicals, (IVB). World Health Organization. 194 WHO Member States. Date of slide: 25 July 2018.

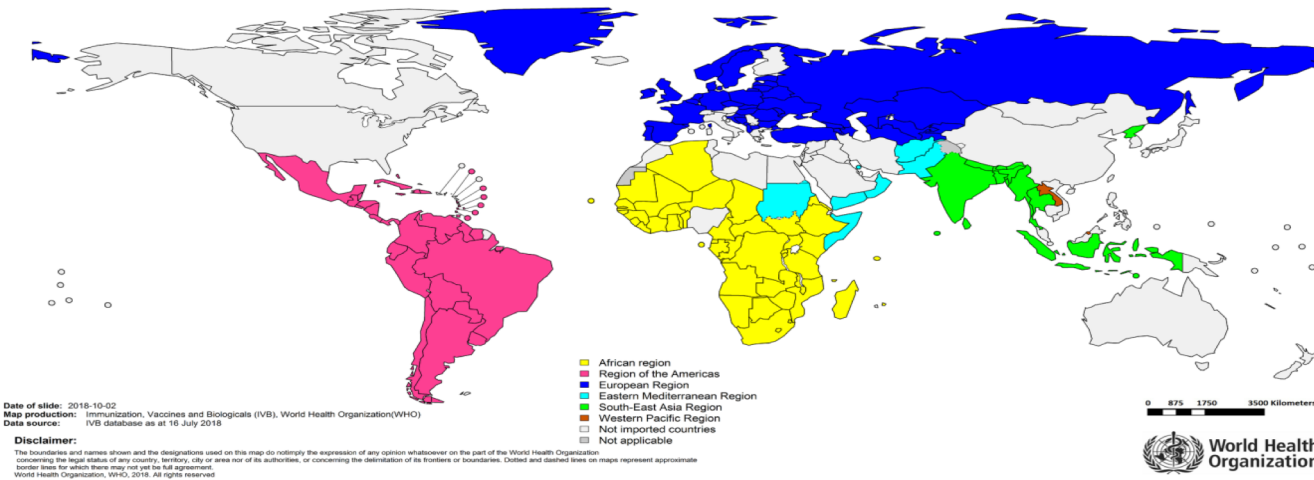
¹. District data not reported in the annual data collection Joint Reporting Form district table of sheet 6 was supplemented from the annual subnational coverage data collection mechanism.

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District level data available for 70% of global birth cohort



Countries which reported 2016 subnational data to HQ for each WHO region

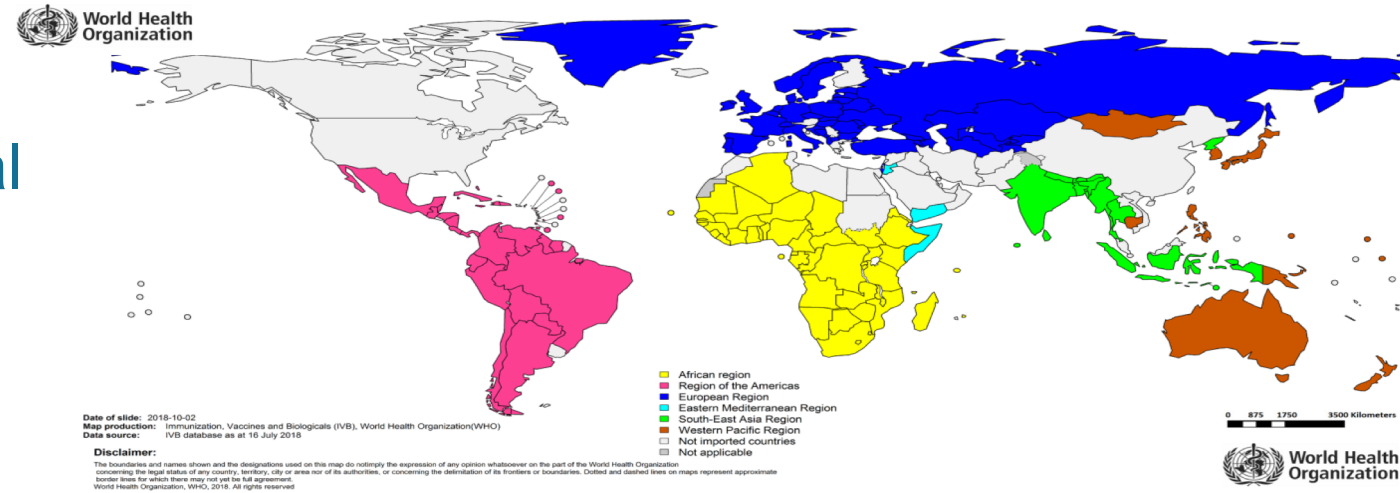


136 countries reported their subnational data to HQ in 2016



Countries which reported 2017 subnational data to HQ for each WHO region

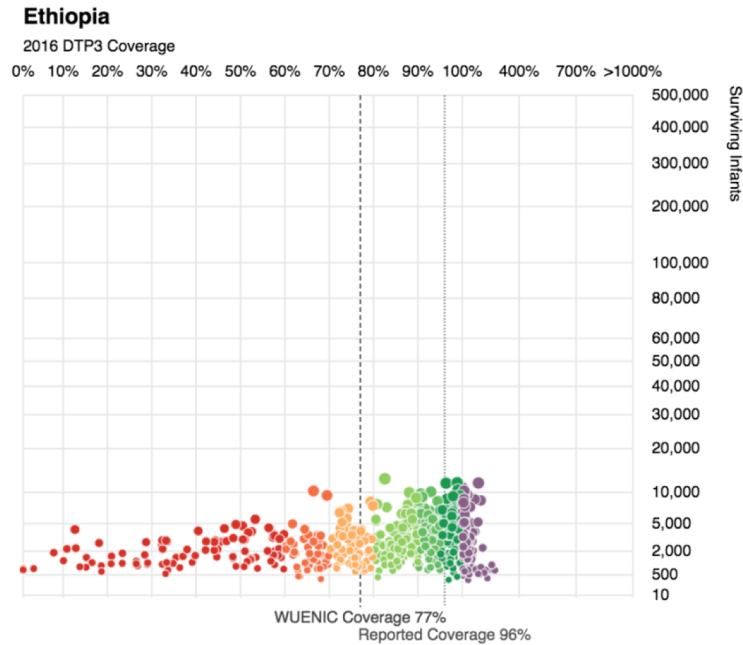
141 countries reported their subnational data to HQ in 2017



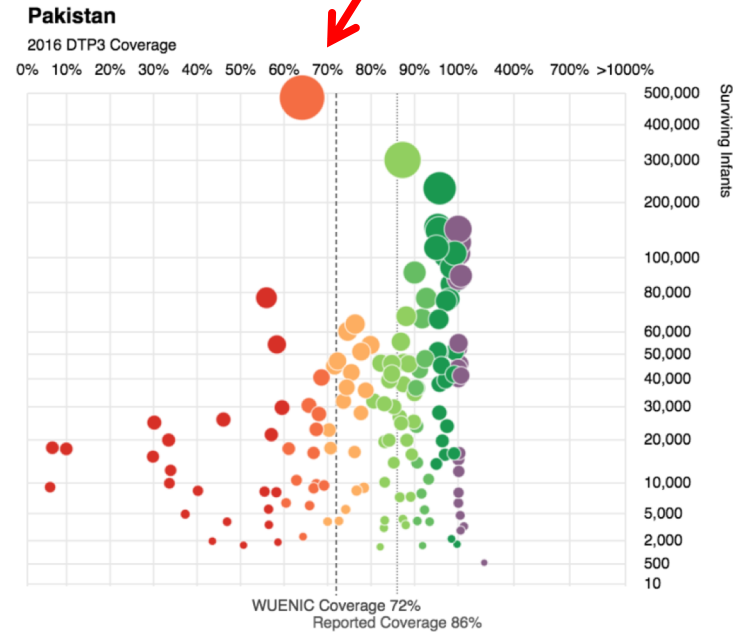
Inequalities between districts of a country

Karachi would be in the top-50 countries as per birth cohort

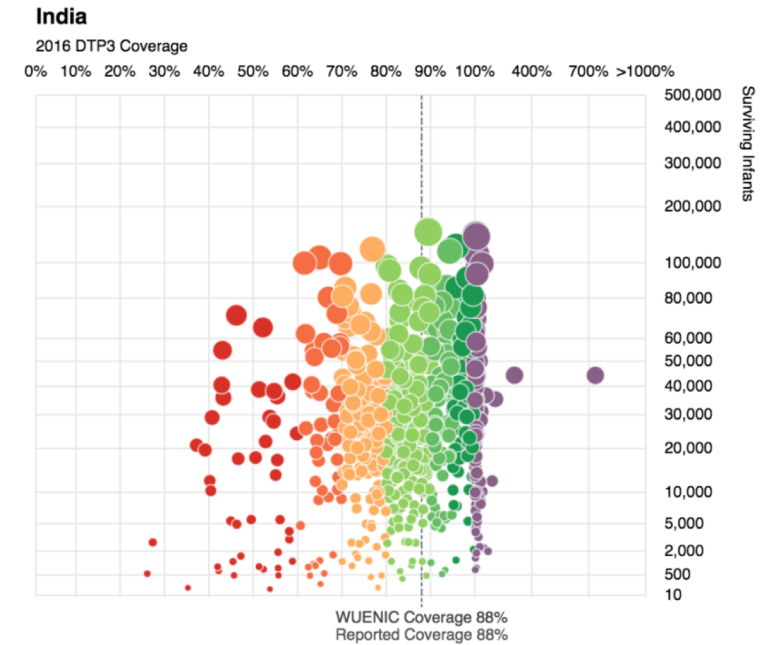
Ethiopia, reported 2016



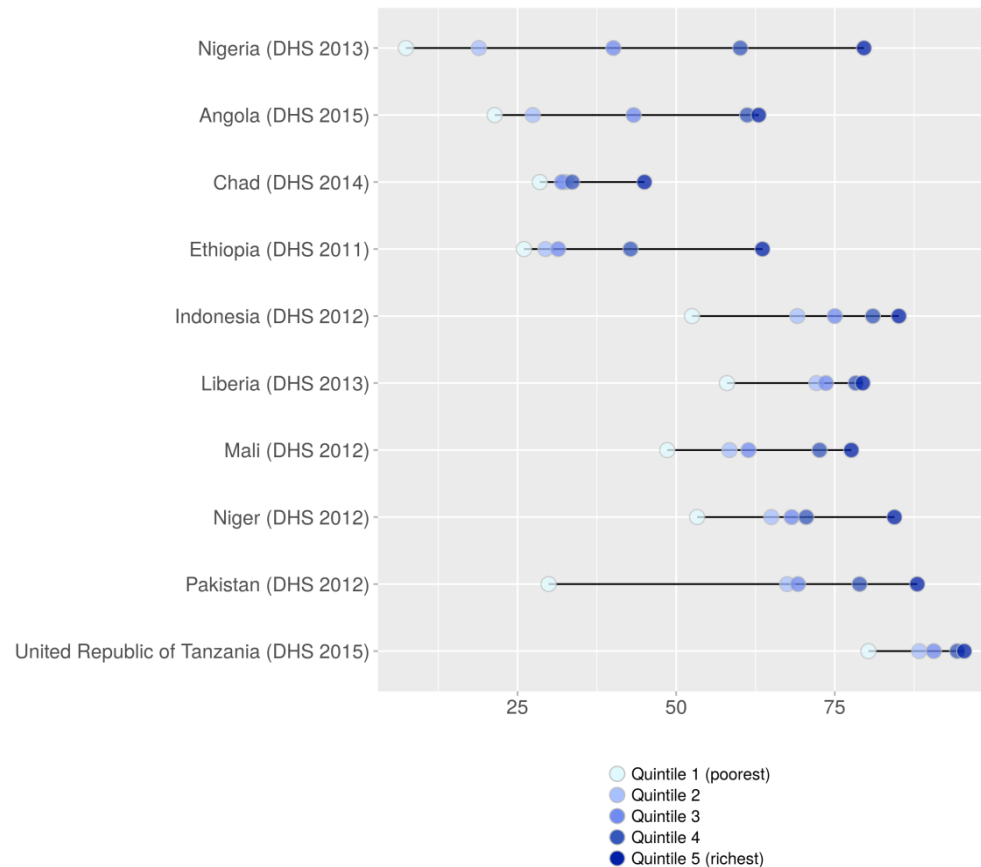
Pakistan, reported 2016



India, reported 2016



But national and district averages mask wide differences



The Paraisópolis favela in Sao Paulo (Foto: Tuca Vieira)

Updated WHO vaccine preventable disease surveillance standards



- Modular document with easy to use web-interface
- http://www.who.int/immunization/monitoring_surveillance/burden/vpd/standards/en/
- Surveillance introduction chapters
 - Reasons for surveillance, components of surveillance, definitions of terminology, confidentiality, prioritization of VPDs for surveillance, laboratory networks, data analysis, evaluation of surveillance, steps of an outbreak investigation
- Disease specific Chapters for 20+ VPDs
- Regular updates as needed
- Emphasis of these standards are on case based surveillance with laboratory confirmation.

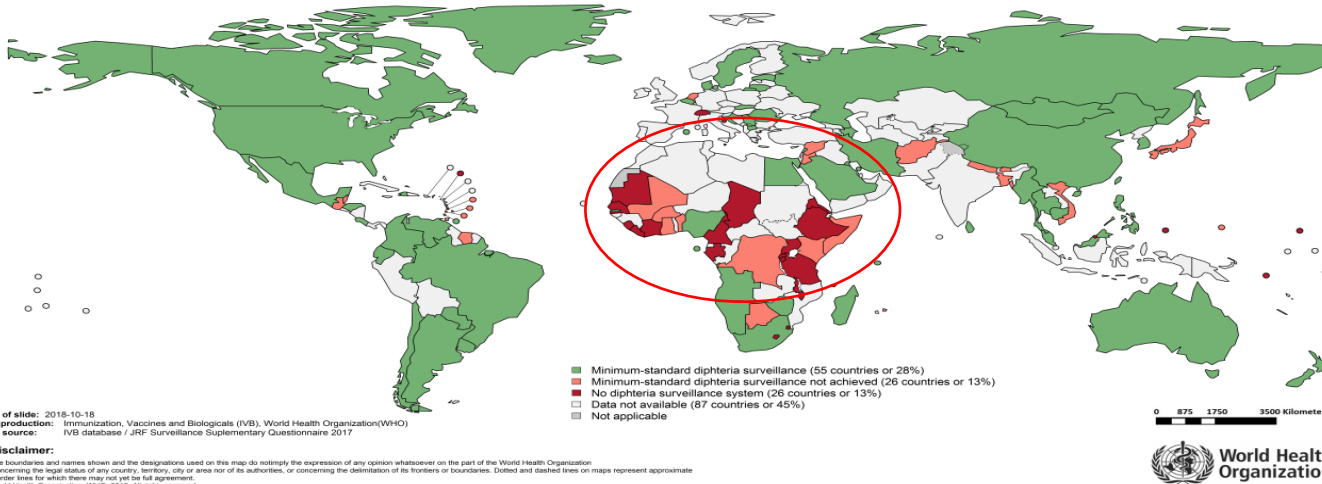


Summary of minimum recommended standards for surveillance for each VPD

Country commitment	Nationwide, case-based with laboratory confirmation of every case	Nationwide, aggregate with laboratory confirmation of outbreaks	Sentinel, case-based with laboratory confirmation of every case	Other
Surveillance commitment in every country	Measles Poliomyelitis	-	-	Neonatal Tetanus (no lab confirmation needed)
Surveillance commitment varies by country	Diphtheria, Meningococcus, Rubella	Hepatitis A, Hepatitis B Mumps	Congenital rubella syndrome, <i>Haemophilus influenzae</i> , Influenza, Japanese encephalitis, Pertussis, Pneumococcus, Rotavirus, Typhoid	Cholera HPV (surveillance not recommended) Non-neonatal Tetanus (no lab confirmation needed) Varicella

Who is looking for Diphtheria?

Diphtheria Minimum-Standard Surveillance System

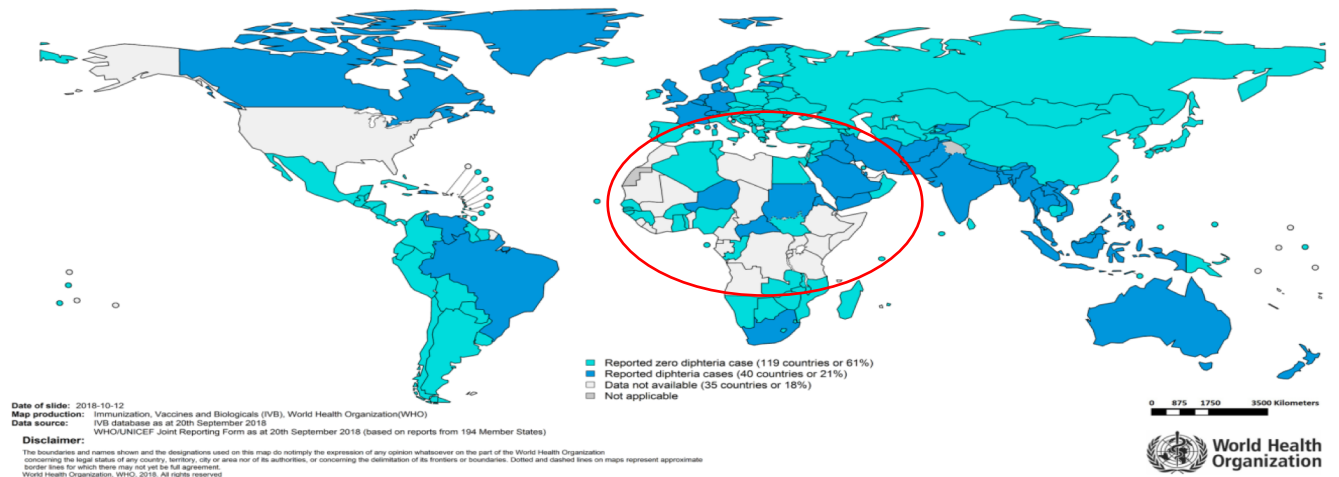


Minimum surveillance standard

- Case based
- Lab confirmed
- Nation wide

Reported diphtheria cases for 2017

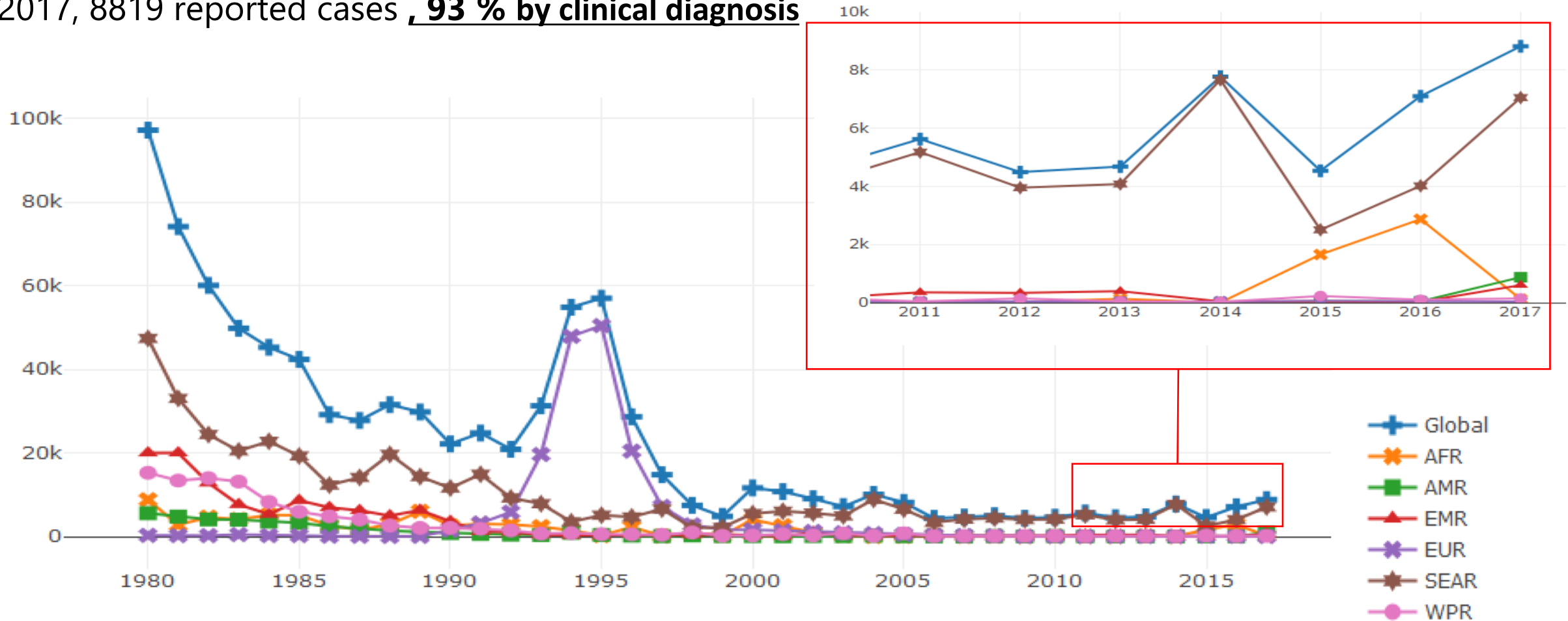
Diphtheria cases reported in the 2017 JRF



How much diphtheria is there ?

Mostly driven by clinical diagnosis.

In 2017, 8819 reported cases , **93 % by clinical diagnosis**



Laboratory diagnosis of diphtheria



- **Role of laboratory**

- provide simple, rapid and reliable methods to help clinicians make correct diagnosis

- **Laboratory methods** used for diphtheria diagnosis:

- Bacterial culture combined with toxigenicity test to inform if it is vaccine preventable



- **Gaps**

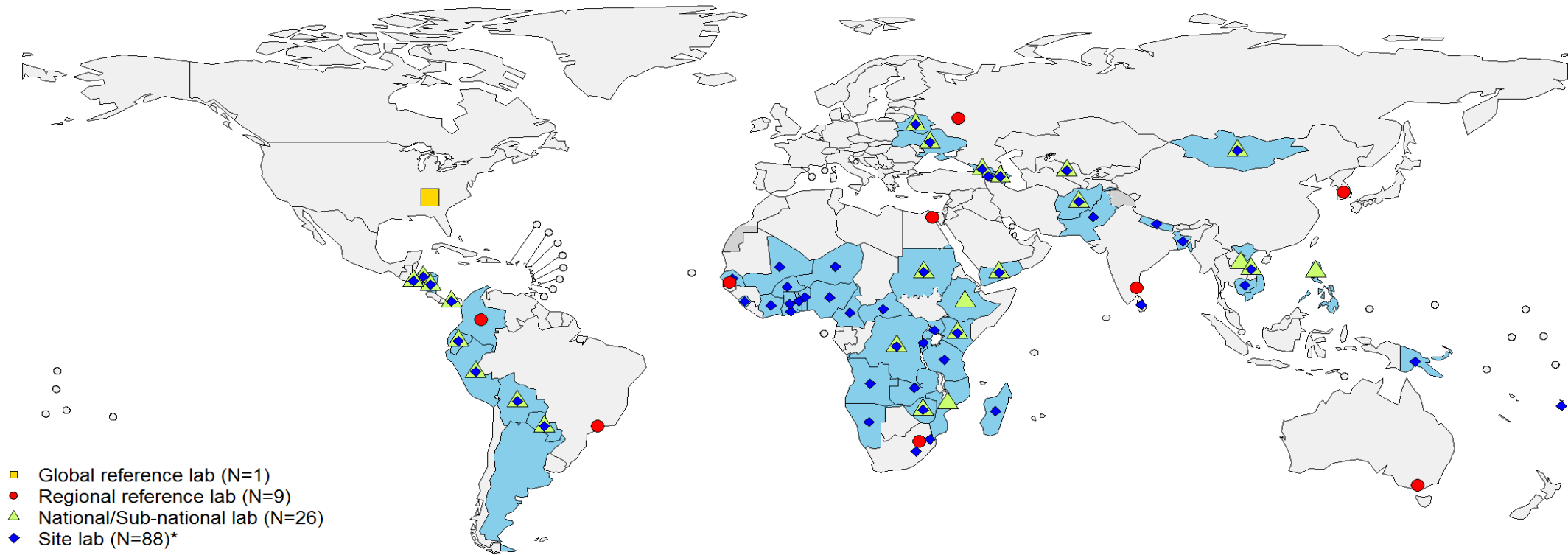
- Bacteriology capacities are often weak
 - Toxigenicity test skills rarely available at country level
 - Lab skills to diagnose diphtheria are lost in many countries due to rarity of disease

- **Needs**

- Essential to retain these skills in this specialized field of microbiology
 - Bringing back the rapid diagnosis test (RDT) in the market will be essential for outbreak situations

Invasive Bacterial VPD surveillance and laboratory network

Platform to be leveraged for other VPD bacterial diseases



- Global reference lab (N=1)
- Regional reference lab (N=9)
- ▲ National/Sub-national lab (N=26)
- ◆ Site lab (N=88)*

- Countries in Global IBD Network (N=54)
- Not applicable

Map production: World Health Organization, WHO, 2017. All rights reserved
Data source: Global IB-VPD Surveillance Network

0 875 1750 3500 Kilometers

Notes:

* Only one sentinel site laboratory plotted by country. Position of labs on the map does not always reflect their exact geographical location.

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WHO Recommendations for Diphtheria vaccination

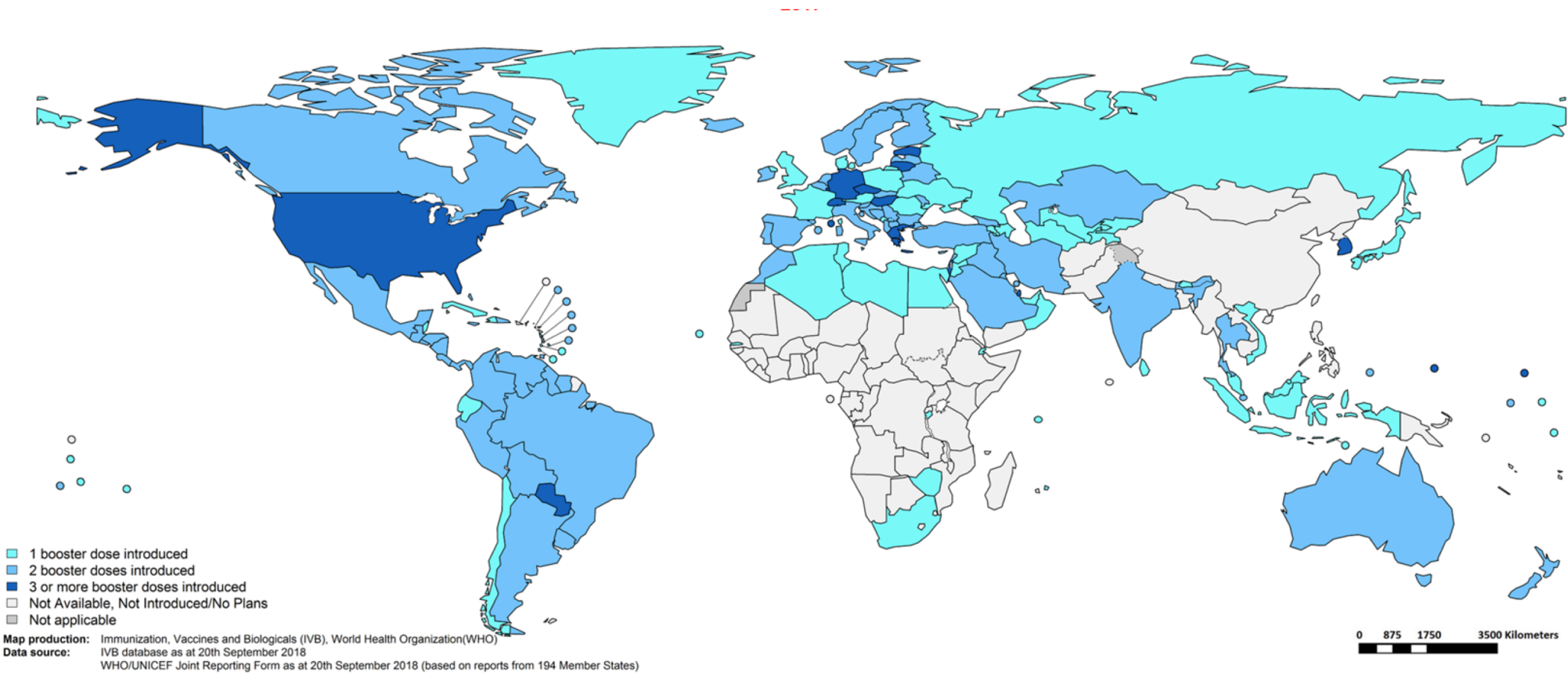


- Routine programs
 - 3 primary doses (prior to 6 mos of age)
 - 3 booster doses (12-23 mos, 4-7 yrs, 9-15 yrs)
- In non-routine settings:
 - Depends on age and previous immunizations
 - If no records than treat as unimmunized



Diphtheria Position Paper Weekly Epid. Record (2017, 92:417-436)

Member States offering Diphtheria Boosters



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World Health Organization, WHO, 2018. All rights reserved

Opportunities

- **Immunization Coverage**

- Optimise use of equity analyses, microplanning and targeted delivery strategies to fill immunity gaps at lowest levels
- Expand and increase implementation of booster dose policy

- **Surveillance**

- Reinforce Surveillance Standards implementation
- Continue laboratory gap analysis and then fill gaps using already existing platforms
- Enhance and expand laboratory capacity building and training

- **Data availability**

- Improve immunization programme data quality at subnational and national levels (Data improvement plan, data triangulation)
- Improve immunization programme data flow across 3 levels of WHO

Background for the project



Some findings of an assessment of immunization information systems in WHO

- Fragmented systems based on a variety of technologies
- Separate databases exist at different levels (inconsistencies)
- Data management efforts are duplicated at each level
- Systems highly dependent on specific individuals
- Analytical and visualization capabilities are limited
- Data are not easily accessible to programme staff and other stakeholders



➔ *Similar issues and risks identified in all Regional Offices and HQ*

➔ *All Offices are interested in a common integrated platform*

WIISE ?

WIISE **is** a collection of applications to collect, manage, analyze and disseminate immunization and VPD surveillance data collected by WHO worldwide.

WIISE **is not** a replacement for Member States' information systems

WIISE = **W**HO **I**mmunization **I**nformation **S**yst**E**m

Datasets in scope (phase 1->Dec 2019)



- **Annual data collected through the Joint Reporting Form (JRF)**
- **Subnational coverage data**
- **Measles/Rubella surveillance data**
- **Supplementary Immunization Activities** (focus on MR)
- **(WUENIC estimates)**
- **Reference data** including GIS



Improved data availability across 3 levels of WHO



MEMBER STATES

Online JRF form (eJRF)

Country	Date report submitted	WHO
10101 Name of person in Ministry of Health responsible for completing this form		
10102 Position/Title		
10103 Email address		
10104 Name of UNICEF contact (Name of the UNICEF contact in the UNICEF office at country)		
10105 Email address of UNICEF contact		
10106 Name of WHO contact (Name of the WHO contact in the WHO office at country)		

Countries / Organizations Information Systems e.g. DHIS2, TeSSy



Surveillance data

Data Loader

WHO ONLY

Data warehouse
Data managed by
Regional Offices



WHO

Dashboards and data
analysis/visualization tools



PARTNERS

Public website



GENERAL PUBLIC

Currently
out of scope

WIISE

In Summary:

- Outbreaks of vaccine preventable diseases continue to occur
 - Response costs are large
- These outbreaks expose gaps in:
 - Vaccination coverage, Surveillance and policy implementation
 - Our immunization programme data systems to be able to adequately understand gaps early
 - Case based surveillance which includes laboratory confirmation
- Opportunities to improve and pre-empt outbreaks require collaboration, investment and consistent efforts among all stakeholders.

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World Health
Organization

Thank You

Extra slides



Global market supply assessment D&T-containing vaccines



Full implementation of WHO recommendations for 6 doses of Diphtheria and Tetanus containing vaccines and use of Td to replace TT will imply an **increase in global demand for all D&T containing vaccine by 20%**

Sufficient global supply for all products – but some risks remain

- **Primary series wP and wP boosters: well supplied** (even if some countries with one registered product at risk)
- **aP containing vaccine products: supply tight for all vaccine products** with very limited flexibility in the short term
- Forecasted increase in **Td** demand from TT replacement and predicted booster dose introductions will **require current suppliers to remain active and increased capacity within 10-15 years**
- **Vigilance required for “less common” vaccine types** at risk of discontinuation (DTwP-HepB, DTwP-Hib, DTaP-IP, Td-IPV, Tdap-IPV)



GLOBAL MARKET STUDY DIPHTHERIA & TETANUS CONTAINING VACCINES

Key Takeaways

- WHO recommends for all countries: 1) a life course of six doses of Diphtheria and Tetanus containing vaccines and 2) use of Td in place of TT
- 100 / 194 countries do not meet these recommendations, but due to conducive circumstances, they are now likely to implement WHO recommendations
- Full implementation of the recommendations would increase global demand for all D&T containing vaccines by ~20%
- Sufficient supply is available to cover both current and future demand for wP / non-pertussis containing vaccines
- Supply of aP-containing vaccines is currently sufficient to support demand from countries where the product is in use; access in additional countries may be problematic
- Countries with only one locally-registered product are at risk of supply shortages, irrespective of the global supply-demand balance

QUICK STATS

NUMBER OF VACCINE TYPES
16

TOTAL NUMBER OF SUPPLIERS
40 (35 producers, 5 distributors)

2017 ESTIMATED MAXIMUM GLOBAL SUPPLY
> 2 billion doses

2017 ESTIMATED GLOBAL DEMAND
~1 billion doses

2016 REPORTED PRICE RANGE (ALL D&T)
US \$0.06–\$42.24

Market Highlights

WHO recommends 6 doses of Tetanus and Diphtheria – 3 DTP-containing doses in infancy plus: i) 1 dose DTP-containing in the 2nd year of life; ii) 1 dose DTP/DT/dT at 4-7 years; iii) 1 dose Td at 9-15 years. WHO also has a long-standing recommendation to transition from TT to Td.¹ Due to an increasing number of reported outbreaks of diphtheria, increasing recognition of gaps in adult immunity to tetanus, as well as a more enabling environment (second year of life, early primary school, adolescent, and maternal vaccination platforms),

implementation of these recommendations by all WHO member states will result in vaccination schedule changes that could lead to product access issues. 115 countries (84% of the global birth cohort) may modify product choice or their EPI schedule for Diphtheria and Tetanus (D&T) containing vaccines to align with WHO policy recommendations (see Figure 1).² 46 of those 115 countries are self-sourcing and lack access to market information. Additionally, some access issues have been already raised by countries in the European and American regions.

TABLE 1: D&T-CONTAINING PRODUCTS AND GROUPINGS³

Primary	2YL / Early Childhood Booster	Pre-Adolescence / Adolescence Booster	Pregnancy & Adult Mono Booster
wP: » DTwP-HepB-Hib » DTwP-HepB aP: » DTaP-HepB-Hib-IPV » DTaP-Hib-IPV » DTaP-HepB-IPV	wP / no aP: » DT » DTwP » DTwP-Hib aP: » DTaP » DTaP-Hib » DTaP-IPV	No aP: » Td » Td-IPV aP: » Tdap » Tdap-IPV	» TT

¹ Diphtheria vaccine: WHO position paper, Weekly epidemiological record, 4 August 2017.

² 100/194 countries do not have the recommended six dose D&T schedule (80M birth cohort (80% world)) and 54/194 countries are using TT only (67M birth cohort (48% world)).

³ Groupings established for analytical purposes, matching as much as possible product utilization in the EPI schedule. Each vaccine product is only present in the group where its use is most common Td and Tdap are also given during pregnancy but for the sake of analysis, only monovalent TT is part of this group. WHO recommends all countries switch from TT to a product containing both tetanus and diphtheria (low dose) for adolescents, adults and pregnant women. As well, Td-IPV and Tdap-IPV can be given to adults.