Measuring Child Mortality

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Overview of Presentation

- Child mortality data

- UN Inter-agency estimates

- Discrepancies between country estimates and UN Inter-agency estimates

Child Mortality Data

- Measures of child mortality
- Data sources
- Data problems

Measures of child mortality

Child mortality: Probabilities of dying during the first 5 years of life, usually broken down by conventional age segments

Category	Includes deaths that occur:
Neonatal mortality	During the first 28 days of life
Post-neonatal mortality	At ages 1 to 11 months
Infant mortality	**Between birth and exact age 1**
Child mortality	At ages 1 to 4 years
Under-five mortality	**Between birth and exact age 5**

Measures of child mortality

Infant (first one year) and under-five mortality rates (first 5 years) are the most commonly calculated probabilities

MDG 4

Under-five mortality rate (U5MR):

Reduce by two thirds between 1990 and 2015.

Data Sources

Child mortality data can come from a variety of sources:

- vital registration systems
- population censuses
- household surveys
- sample registration systems
- demographic surveillance sites

✓Direct: Data from full birth histories, as in DHS and some MICS surveys

✓Indirect: Data from summary birth histories, to use "Brass methods"
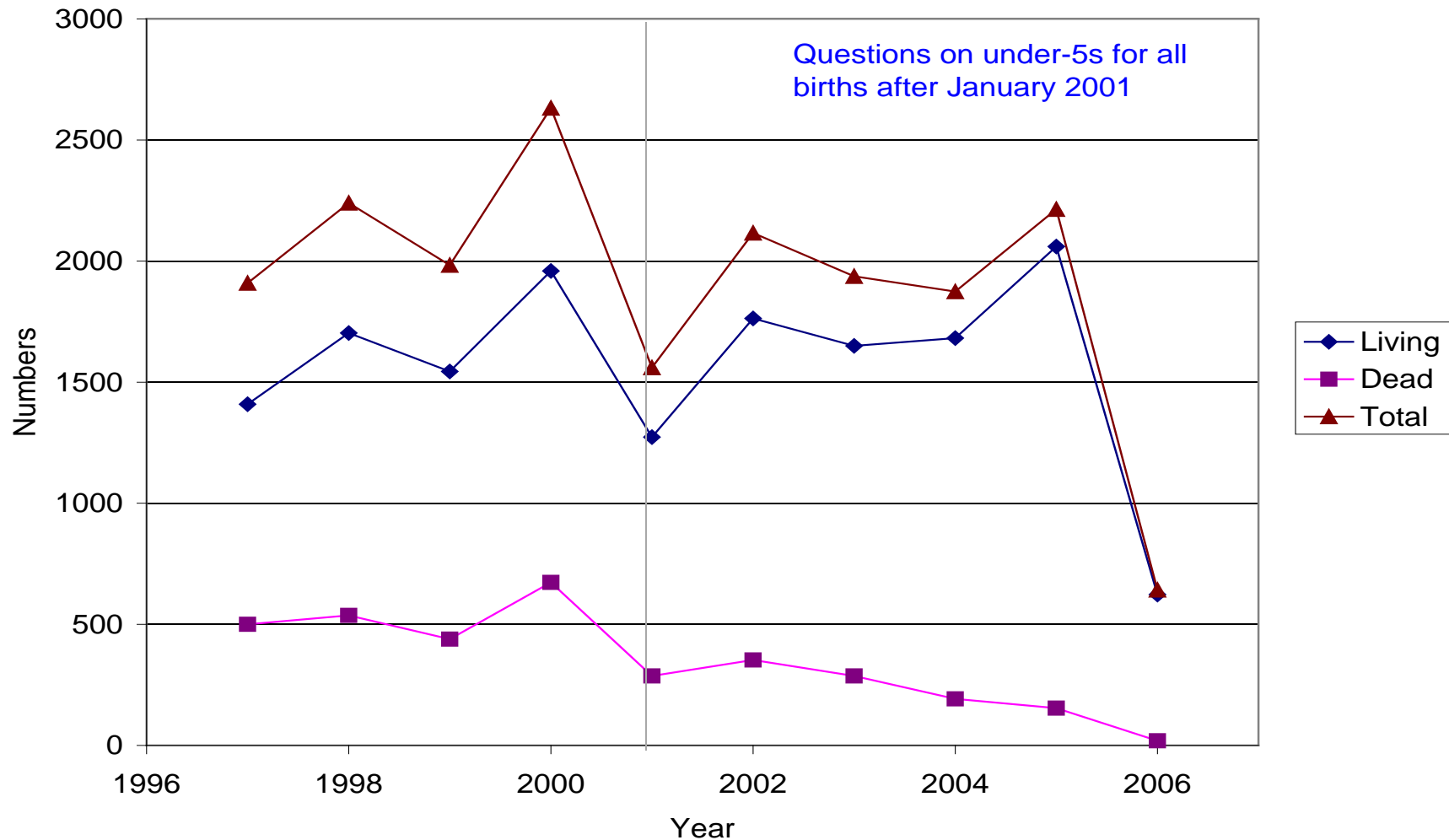
Data problems

Data errors

- sampling errors (surveys)

- omission of deaths

- misreporting of child's age at death or date of birth (direct only)

- selection bias

- violation of assumptions (indirect only)
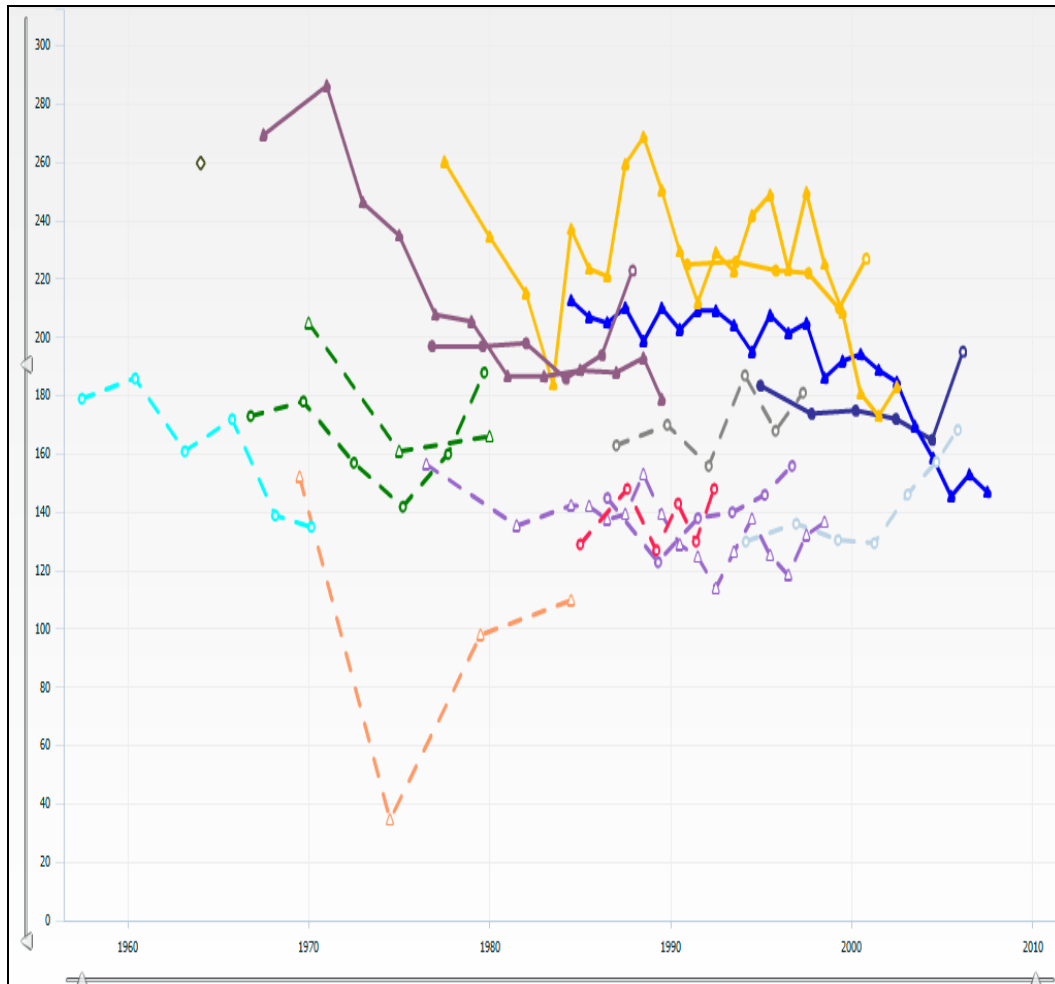
Age heaping: child's death at 12 months

Niger DHS06 - Age at death in months
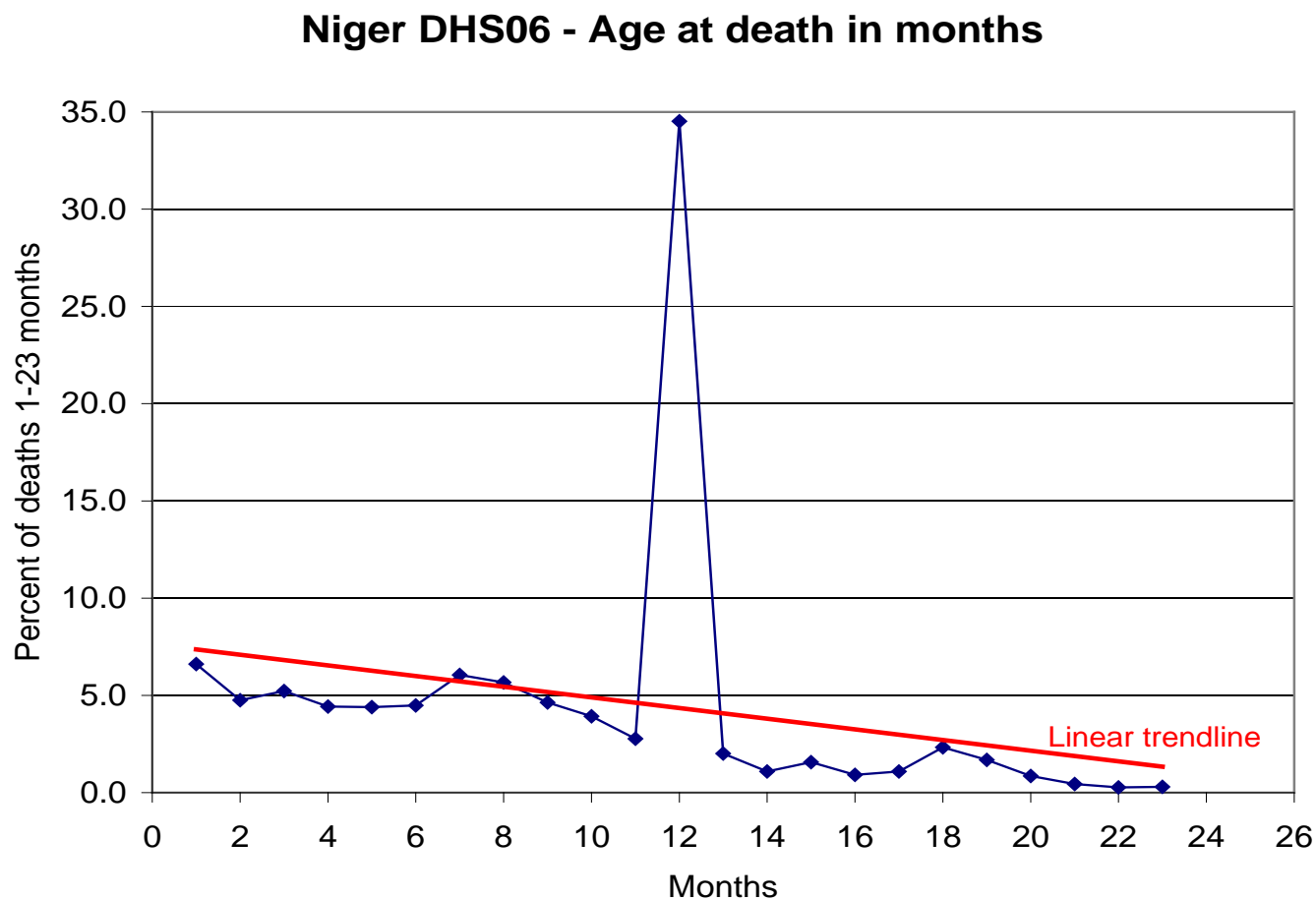
Age shifting: common issue in DHS
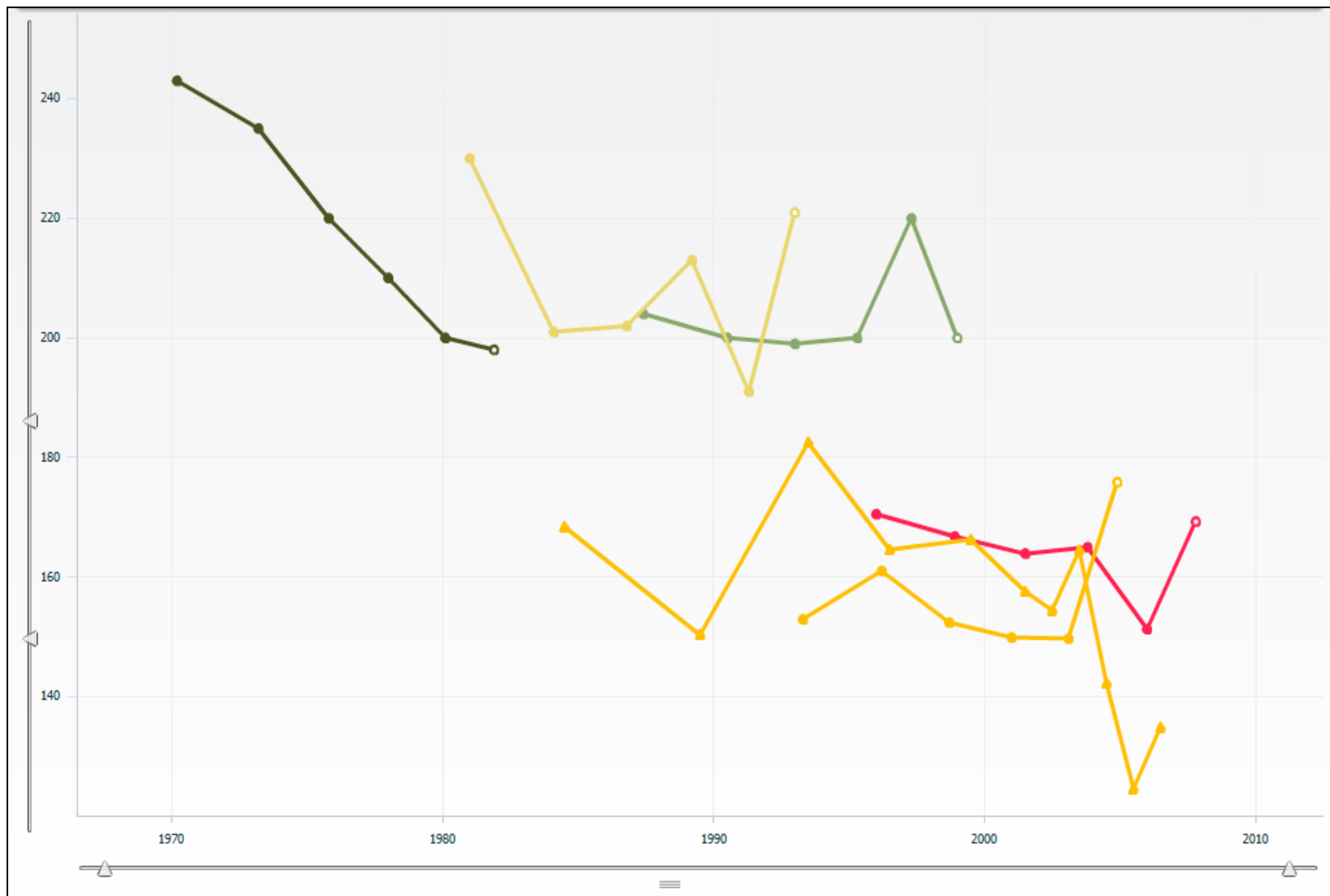
Niger: Births by year, DHS06

Data rich country but with wide variations in mortality levels from different sources

Nigeria has one of the widest spreads of source data, with a range from 120 to 240 deaths per 1,000 live birth
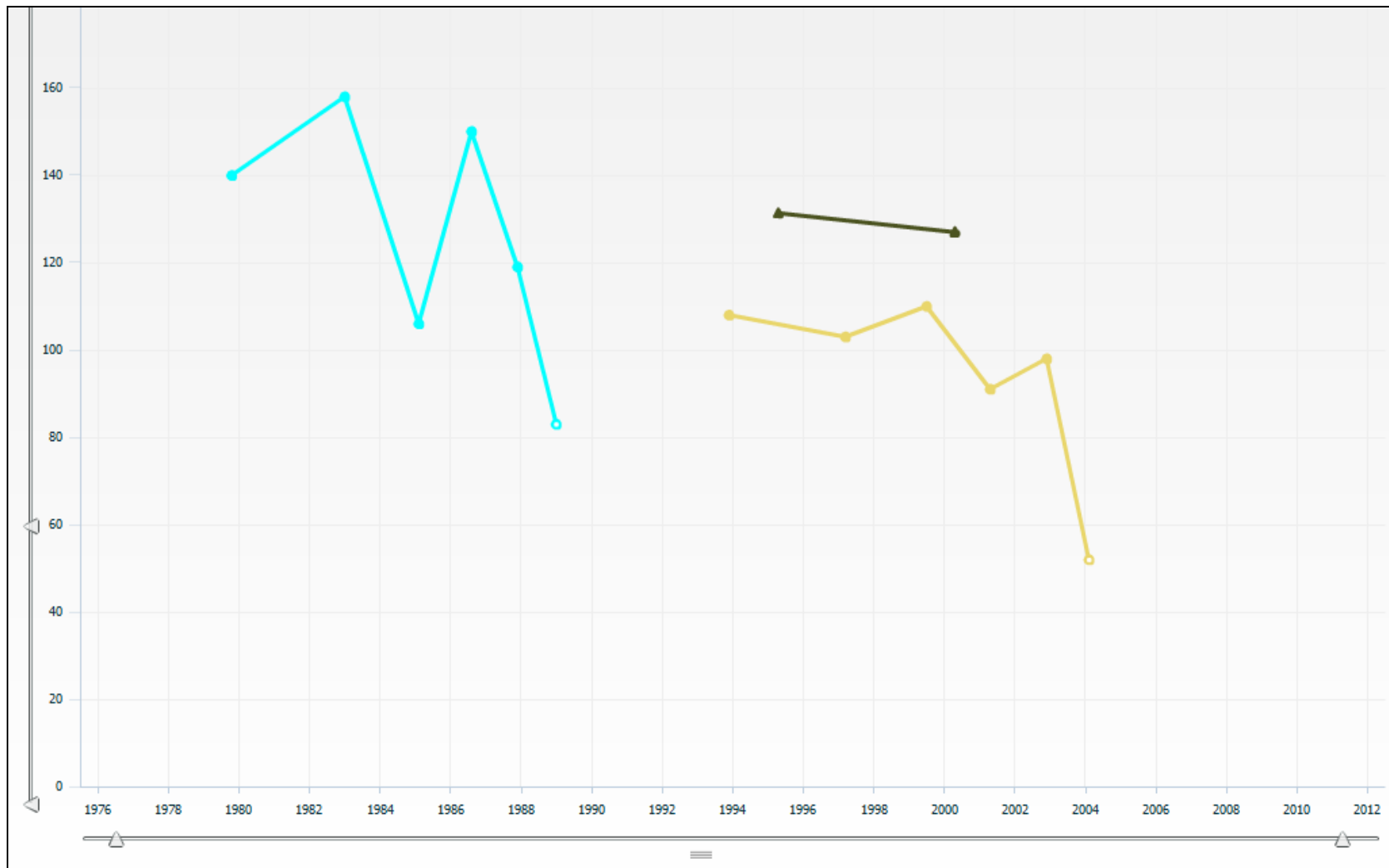
Data poor country with wide variations
Congo DR

Data poor country with messy data
Djibouti

Key messages on child mortality data

- Vital registration data is the preferred source of data for child mortality if the system is well functioning. Currently only about 50 countries have vital registration data that are considered good enough to be the sole source of data for child mortality.

- Available data suffer from sampling or non-sampling errors. Under-reporting of births and deaths, age misreporting are common issues.

- Available data collected by countries are often inconsistent from one data source to another. It is important to analyze, reconcile and evaluate all data sources simultaneously for each country. Each new survey or data point must be examined in the context of all other sources, including previous data.

- Available data are bracketed by a range of uncertainty.

UN Inter-agency Estimates

- History of child mortality estimation
- The UN IGME
- IGME approach to measuring child mortality

The UN Inter-agency Group for Child Mortality Estimation (IGME)

- Formed in 2004, led by **UNICEF, WHO**, and includes members of **UN Population Division** and **The World Bank**

- Objectives of the IGME
  - Harmonize estimates within the UN system
  - Improve methods for child mortality estimation
  - Produce consistent estimates of child mortality worldwide for reporting on progress towards MDG 4
  - Enhance the capacity of countries to produce timely estimates of child mortality

Technical Advisory Group of the UN IGME

- Technical Advisory Group (TAG)
  - Independent
  - Composed of leading experts in demography and biostatistics
  - Provide technical guidance on estimation methods, technical issues and strategies for data analysis and data quality assessment

Latest estimates

Levels & Trends in **Child Mortality**

Report 2012

Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation

unicef • World Health Organization • THE WORLD BANK • United Nations

UNICEF and WHO on behalf of the UN IGME released new estimates on Sep 13, 2012

www.childmortality.org
www.childinfo.org

UN IGME approach to measuring child mortality

- **Compile all available nationally-representative empirical data** - civil registration, survey, censuses, and surveillance system - relevant to the estimation of child mortality.

- **Assess data quality** and adjust empirical data if necessary to account for possible biases in data collection.

- **Apply standard methods** to generate estimates of child mortality – fitting a curve to underlying data.

- Use the model to **extrapolate estimates** to a target year.

- **Additional adjustment** applied to countries with high HIV/AIDS prevalence

Note: Estimates generated in different rounds may not be comparable
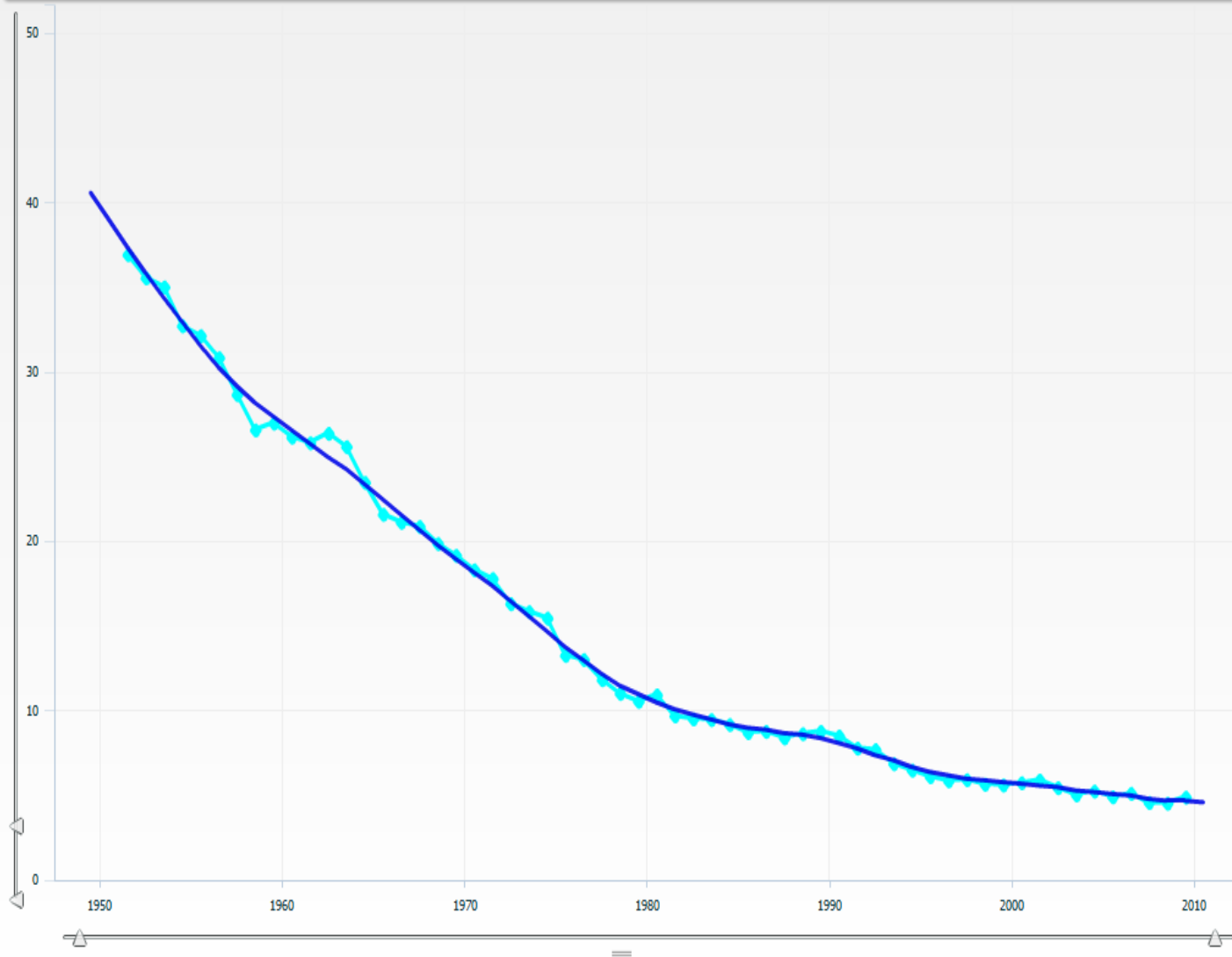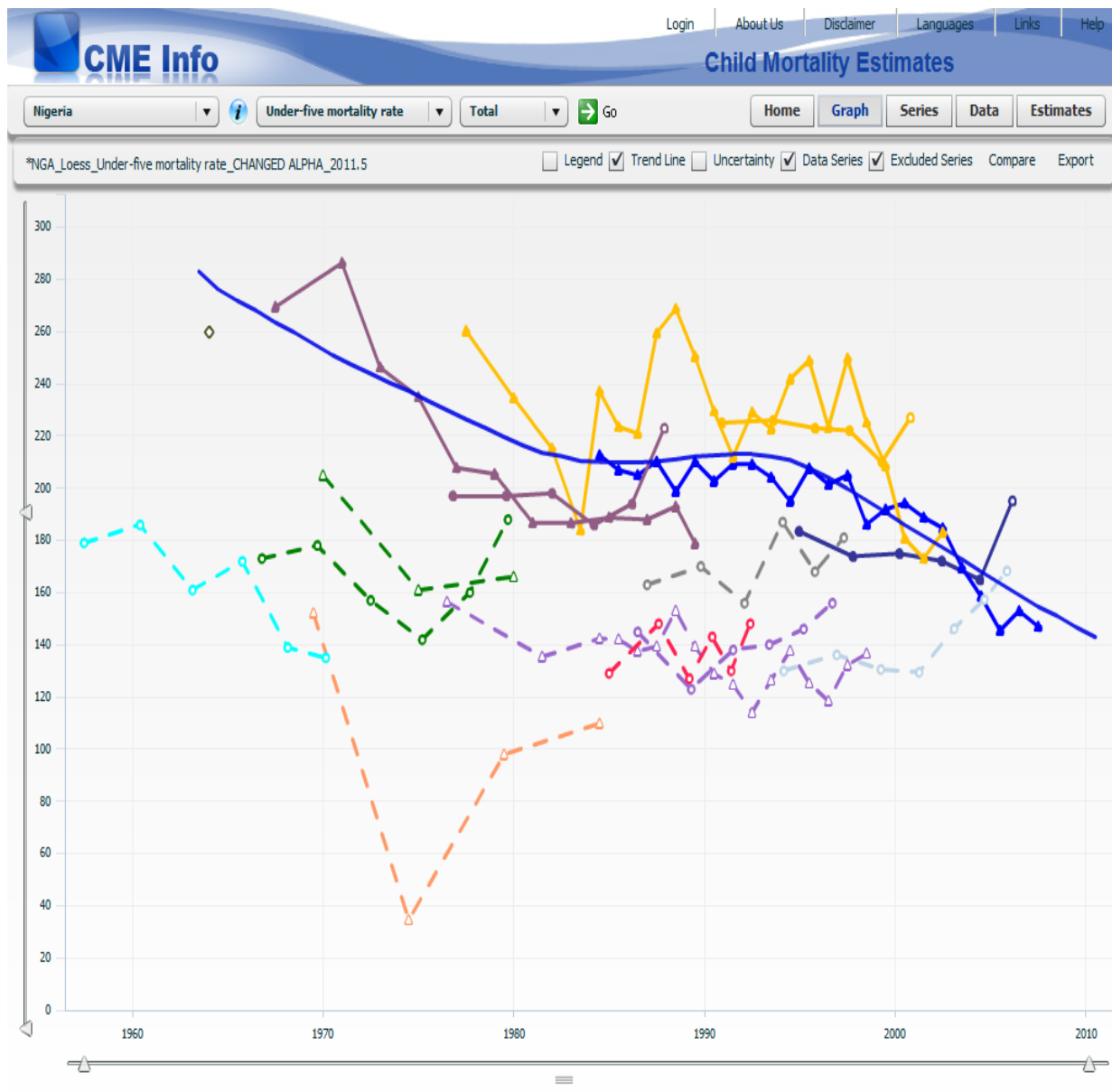
Countries with good vital registration (VR) data: fitting curves to VR data

Countries with other data sources:

Exclude poor quality data, then fit curves

In driving the estimate line, all sources with dotted lines are rated of lower quality and are not used.

Why use model to derive estimates instead of using data directly from surveys or censuses as official estimates?

- Lack of a single source of high quality data covering the last several decades
  - Lack of civil registration systems that accurately record all births and deaths
- Data quality issues in some surveys
- Discrepancies may exist between estimates from different surveys
- Survey data are usually not timely
  - Direct estimates: refer to a five year period prior to the survey
  - Indirect estimates: from women aged 25-29, refer to about 2-3 years before the survey
- Consistent trend line from 1990 is needed for monitoring MDG 4

Key messages on UN-IGME estimates

- Goal – provide the best possible estimates

- Estimates are bracketed by a wide range of uncertainty

- To produce the UN interagency estimates, a series of decisions had to be made:
  - ✓ Data quality assessment
  - ✓ Modeling approach
  - ✓ Additional adjustment for countries with high HIV prevalence, civil unrest or natural disaster

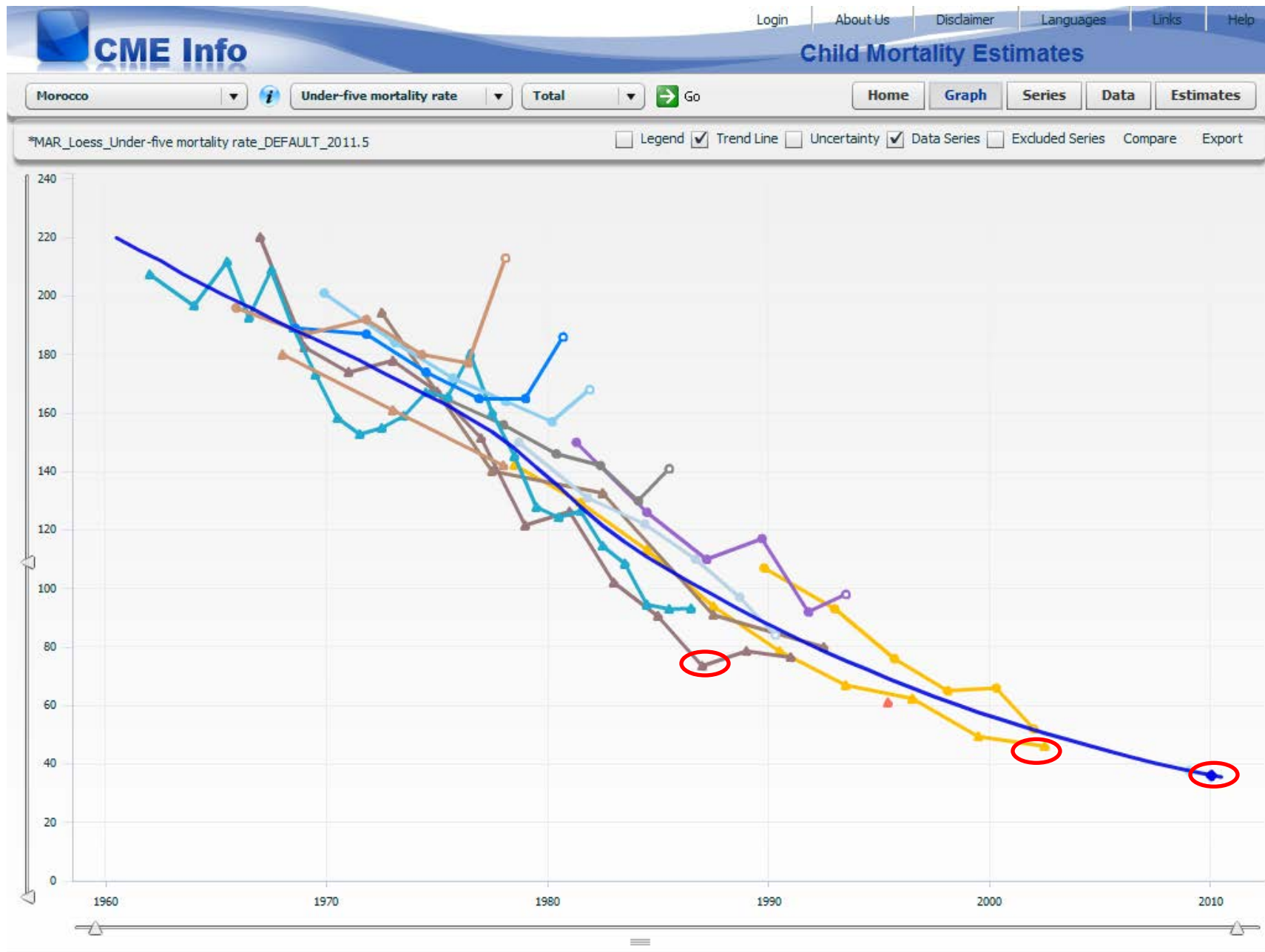**Discrepancies between national estimates and the UN-IGME estimates**

National child mortality estimates

- Official country estimates may be obtained from
  - just one specific source (more often from vital registration systems, household surveys such as MICS and DHS or a census),
  - a combination of data sources,
  - or using different estimation methods from IGME.

# Reasons for discrepancies between national estimates and the UN-IGME estimates

- The UN-IGME estimates are generated based on national data. Due to the methods applied, estimates may not always correspond precisely to the results from the most recent available data source, or to country official estimates, which may have been derived using alternate valid methods.

- National estimates may refer to an earlier calendar year than the UN-IGME estimates.

- It is important to point out that in the absence of error-free data there will always be substantial uncertainty around data or estimates.

Morocco, under-five mortality rate

Djibouti
under-five mortality rate
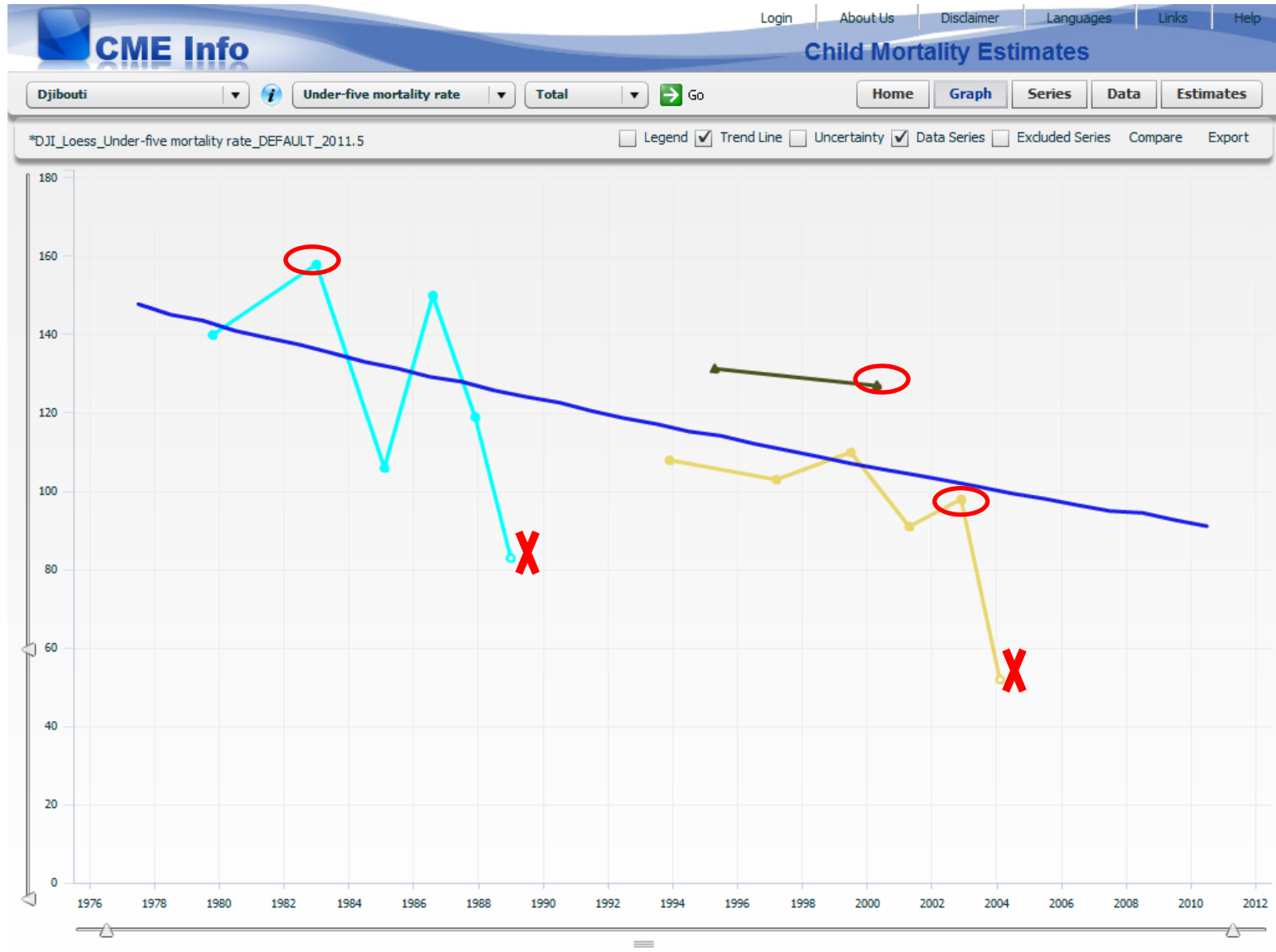
Addressing discrepancies

UNICEF, as the lead agency of the UN-IGME, has been involved in discussions that concern discrepancies between country and inter-agency estimates through:

- Regional workshops on child mortality
- Country visits
- Dialogue with country
- Information notes
- CMEInfo

Usually, such efforts to address discrepancies lead to a mutual understanding of country and inter-agency estimates, and of the nature of differences.

Capacity building

- Five regional workshops since 2008
  - Asia, 2008 (23 countries/71 participants)
  - Latin America, 2009 (14 /30)
  - West and Central Africa, 2009 (21 /49)
  - Eastern and Southern Africa, 2010 (20/56)
  - Middle East and North Africa, 2010 (16/60)

  In total: more than 250 participants from about 100 countries

- Two regional workshops planned for 2013
 - CEE/CIS, ESARO – not finalized

  These workshops provided: Strengthen capacity in child mortality estimation, feedback on missing data and feedback on plausibility of estimates

Capacity building

- Individual country visits to discuss child mortality estimates and provide technical support, including:

  Rwanda (2008), Mexico (2008), Brazil (2008), Nigeria (2009), Suriname (2010), Mongolia (2010), Belarus (2011), South Africa (2011), Azerbaijan (2012), Kazakhstan (June 2013), Uzbekistan (June 2013)
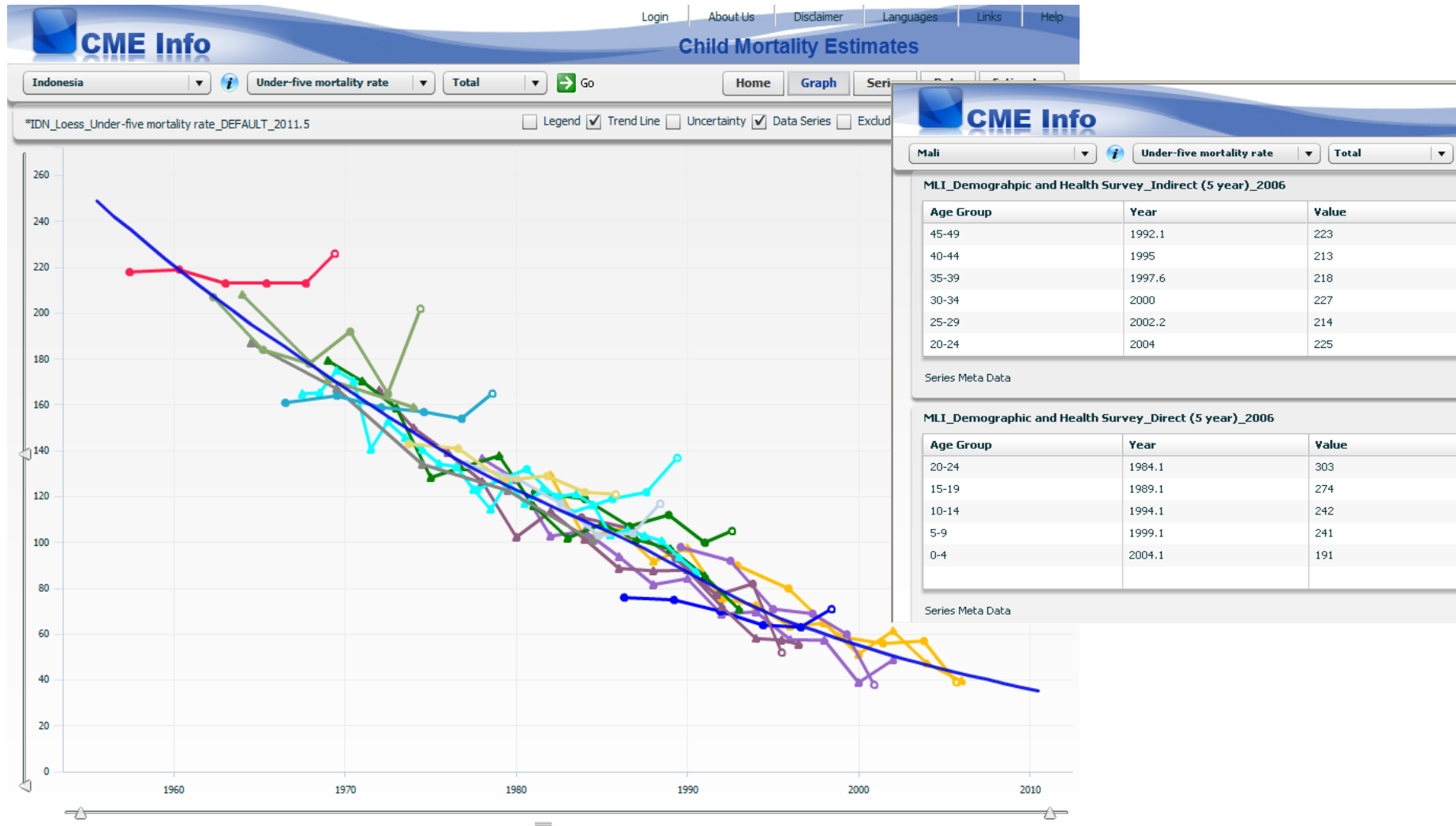
CME Info

The IGME's Child Mortality Database: **www.childmortality.org**
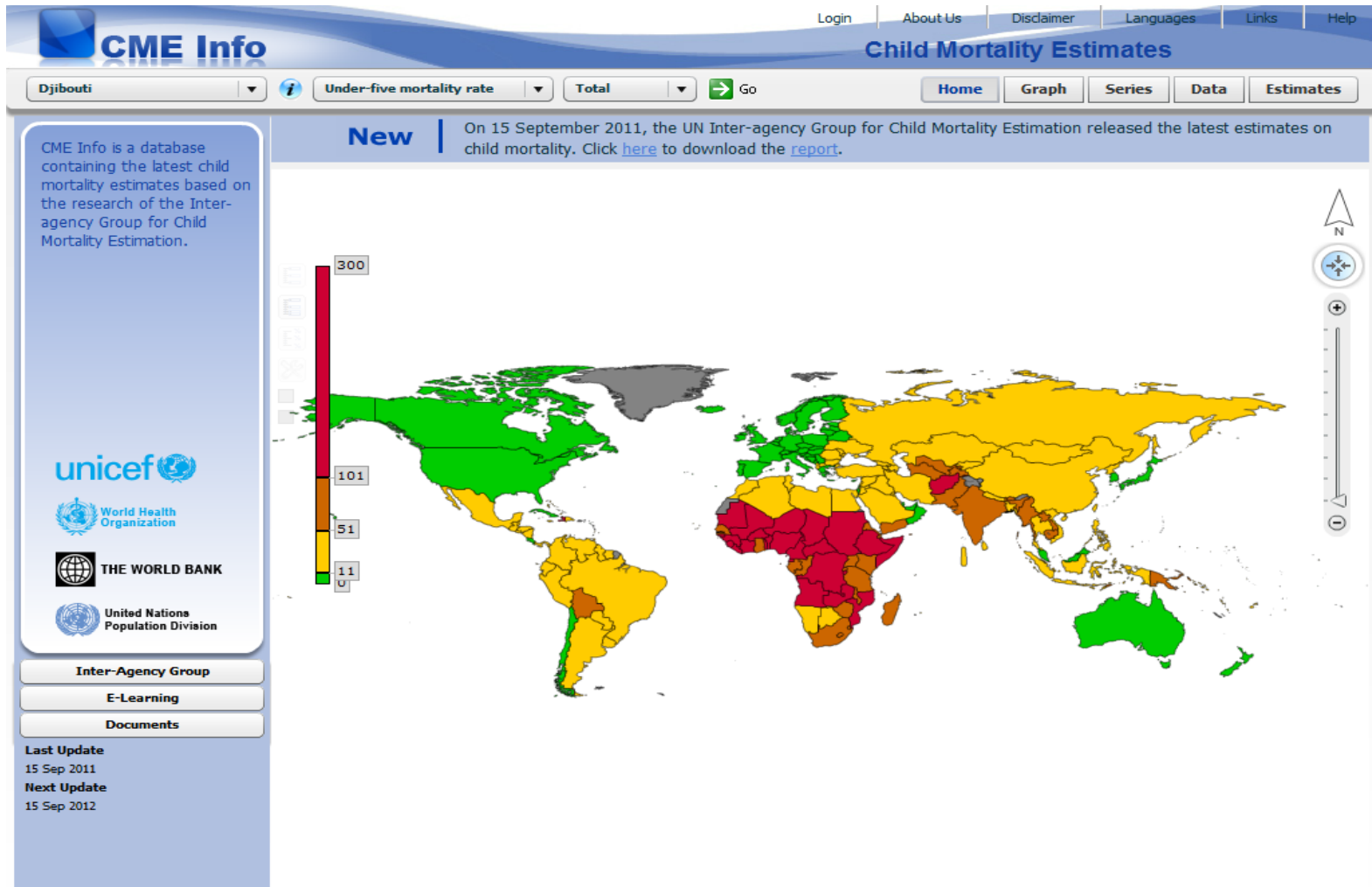
CME Info

www.childmortality.org

To Summarize

Key messages

- Data suffer from sampling and non-sampling errors and are often inconsistent from one source to another. Data quality assessment is important.

- Need to recognize the importance of uncertainty range around data and estimates.

- Estimates from different sources are not comparable (differ in methodologies, time periods, data, etc.).

- For the most part, these different estimates provide a general sense of the magnitude of the problem, but nothing more.

- The UN-IGME and other partners aim for a transparent process, reproducible methods, and country involvement and strive to follow these principles in the process leading to the inter-agency estimates.

Key messages

- Global estimates are only as good as the underlying data and much work remains to be done to improve both data availability and quality at country level.

- child mortality estimation is not simply an academic exercise but is a fundamental part of effective policies and programming.

- Discussions around different estimates and modeling strategies should not deflect from the urgent actions required to address child mortality and morbidity.

Thank you