Release statement

Reproductive, maternal, newborn, child, and adolescent health and development indicators at district level for 2015-16 India, version 1.0

18/08/2022

Release content

1. India_indicators.gdb
2. India_indicators.csv

File descriptions

1. **India_indicators.gdb*:*** a geodatabase containing a shapefile with appended data on the estimates of the different indicators at the district level in India

India_indicators.gdb/India_indicators: The dataset presented here is a shapefile of India within the geodatabase with the summary of the different indicators at the district level. The shapefile of the administrative boundaries for the districts was adapted from a dataset provided by the Children's Investment Fund Foundation (CIFF, 2021, personal communication, 14 April). District level estimates are presented for rare events/modelled-based indicators at district level using NFHS-4, while min, max, mean and range are presented for summaries from all other indicators derived from high-resolution maps. The following are the name of the fields (aliases) of the different indicators found within the shapefile with their description:

Still birth rate (NFHS4)

District level estimates of stillbirth rate are calculated as the number of pregnancies that lasted seven or more months and terminated in a foetal death in the five years preceding the survey per

1000 births (stillbirths plus the number of live births in the five years preceding the survey). The data used have been collected by the India 2015-16 National Family Health Survey (NFHS-4) which includes as respondents all women aged between 15 and 49 years old. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Child mortality rate (NFHS4)

District level estimates of child mortality rate, defined as the probability of a child dying on or after their first birthday but before reaching the age of five years expressed per 1000 children surviving their first, are calculated using a synthetic cohort life table approach which combines mortality probabilities for specific age segments (12–23, 24–35, 36–47, and 48–59) into the standard age segment (1 to 4 years). The mortality probability is calculated using a generalised linear model that assume that the variable of interest, number of deaths in this case, as a random variable and the distribution of the deaths is assumed to be binomial (1). The data used have been collected by the India 2015-16 National Family Health Survey (NFHS-4) which includes as respondents all women aged between 15 and 49 years old. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Neonatal mortality rate (NFHS4)

District level estimates of neonatal mortality rate, defined as the probability of a child dying before reaching the age of 1 month expressed per 1000 children surviving their first, are calculated using a synthetic cohort life table approach. The mortality probability is calculated using a generalised linear model that assume that the variable of interest, number of deaths in this case, as a random variable and the distribution of the deaths is assumed to be binomial (1). The data used have been collected by the India 2015-16 National Family Health Survey (NFHS-4) which includes as respondents all women aged between 15 and 49 years old. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Total Fertility rate (NFHS4)

District level estimates of total fertility rate, calculated as total fertility rate for the three years preceding the survey for age group 15-49 expressed per 1000 woman, are calculated using a generalised linear model that assume that the variable of interest, number of births in this case, as a random variable and the distribution of the deaths is assumed to be binomial (1). The data used have been collected by the India 2015-16 National Family Health Survey (NFHS-4). All women aged between 15 and 49 years old were included. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

ASFR 15-19 (NFHS4)

District level estimates of age-specific (15-19) fertility rate, calculated as age-specific fertility rate (15-19) for the three years preceding the survey for age group 15-49 expressed per 1000 woman, are calculated using a generalised linear model that assume that the variable of interest, number of births in this case, as a random variable and the distribution of the deaths is assumed to be binomial (1). The data used have been collected by the India 2015-16 National Family Health Survey (NFHS-4) which includes as respondents all women aged between 15 and 49 years old. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

ASFR 20-24 (NFHS4)

District level estimates of age-specific (20-24) fertility rate, calculated as age-specific fertility rate (15-19) for the three years preceding the survey for age group 15-49 expressed per 1000 woman, are calculated using a generalised linear model that assume that the variable of interest, number of births in this case, as a random variable and the distribution of the deaths is assumed to be binomial (1). The data used have been collected by the India 2015-16 National Family Health Survey (NFHS-4) which includes as respondents all women aged between 15 and 49 years old. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Teenage pregnancies (NFHS4)

District level estimates of teenage pregnancies proportion which are calculated as percentage (%) of women within 15-19 years old who have given birth or are pregnant with their first child. The data used have been collected by the India 2015-16 National Family Health Survey (NFHS-4) which includes as respondents all women aged between 15 and 49 years old. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

ANC timing (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from the prediction (mean) of gridded surface of the % of women who had a live birth in the five (or three) years preceding the survey whose first antenatal care visit was at less than 4 months. The data were collected from the India 2015-16 National Family Health Survey (NFHS-4). Within the DHS surveys, all women aged between 15 and 49 years old were asked about their number and timing of antenatal visits during the five years preceding the survey. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

ANC 4+ (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of women who have had at least 4 antenatal care (ANC) visits during pregnancy. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

ANC screening infections - blood sample (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of women with a live birth in the five (or three) years preceding the 2015-16 National Family Health Survey (NFHS-4) who received antenatal care for the most recent birth with blood sample taken. The denominator for this indicator is women who had a live birth in the five (or three) years preceding the survey and received ANC. Women surveyed were aged 15-49. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

ANC screening infections - urine sample (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of women with a live birth in the five (or three) years preceding the 2015-16 National Family Health Survey who received antenatal care (ANC) for the most recent birth with urine sample. The denominator for this indicator is women who had a live birth in the five (or three) years preceding the survey and received ANC. Women surveyed were aged 15-49. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Child marriage- girls (below 15) (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of child marriage for females under the age of 15. Female child marriage has been calculated as the % of women whose first marriage or consensual union occurred before the age of 15 over the full sample of women aged 15-49. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Child marriage- girls (below 18) (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of child marriage for females under the age of 18. Female child marriage has been calculated as the % of women whose first marriage or consensual union occurred before the age of 18 over the full sample of women aged 15-49. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Women decision-making on health (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of women who decide on their own health care either alone or jointly with partner. The method for

constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Contraceptive prevalence (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of currently married or in union women currently using any modern method of contraception. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Comprehensive knowledge of HIV (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of women who have comprehensive knowledge of HIV. Comprehensive knowledge is defined as: knowing that consistent use of condoms during sexual intercourse and having just one uninfected faithful partner can reduce the chances of getting HIV/AIDS, knowing that a healthy-looking person can have HIV/AIDS, and rejecting two common misconceptions about transmission or prevention of HIV/AIDS. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

NAR secondary - girls (%) (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of female net attendance rate for secondary school. The net attendance rate for secondary school is defined as the percentage of secondary school age girls attending secondary school. Explicitly, the denominator of the proportion is the total count of secondary school aged girls, and the numerator is the count of secondary school aged girls attending secondary school. Data on the % of female net attendance rate for secondary school is collected in the 2015-16 DHS India survey (NFHS-4). The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

NAR secondary - boys (%) (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of male net attendance rate for secondary school. The net attendance rate for secondary school is defined as the percentage of secondary school age boys attending secondary school. Explicitly, the denominator of the proportion is the total count of secondary school aged boys, and the numerator is the count of secondary school aged boys attending secondary school. Data on the % of male net attendance rate for secondary school is collected in the 2015-16 DHS India survey (NFHS-4). The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Female labour force participation (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of employed women among those currently in a union. Employment status in the last 12 months among those currently in a union. The indicator includes those who worked in the past year, those who are currently working and those who have a job but were on leave over the last 7 days. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Iron+folic acid (IFA) during pregnancy (%) (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of women with a live birth in the five (or three) years preceding the 2015-16 National Family Health Survey who received iron tablets or syrup during antenatal care. The denominator for this indicator is women who had a live birth in the five (or three) years preceding the survey. Women surveyed were aged 15-49. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Low Birth Weight (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of children weighing below 2.5kg at birth. The denominator of the proportion is the total count of live births in the five years preceding the survey that have a written record of the child's weight at the time of birth or the mother was able to recall the child's weight. The numerator of the proportion is the count of instances where the birth weight is less than 2.5kg. Data on low birthweight was collected in the 2015-16 DHS India survey. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Vitamin A supplements (children 6-59 months) (%) (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of children aged 6-59 months who were given vitamin A supplements. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Stunting prevalence (NFHS4) ***(-MIN-MAX-MEAN-RANGE)***

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of children stunted. Stunting is defined as having height-for-age more than two standard deviations below the World Health Organization (WHO) Child Growth Standards median among children under age five years. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Wasting prevalence (NFHS4) (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of children wasted. Wasting is defined as having a weight for height z-score (WHZ) more than 2 standard deviations below the World Health Organization (WHO) Child Growth Standards median among children under age five years. The method for constructing the indicator was adapted from

the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Experience of Physical Violence (NFHS4) *(-MIN-MAX-MEAN-RANGE)*

District level summaries from high-resolution (5x5km) prediction (mean) gridded surface of the % of women aged 15-49 who have experienced physical violence since the age of 15 by anyone. The indicator measures the experienced physical violence since age 15 among women aged 15-49, for all women who were selected and interviewed for the physical violence module in the NFHS-4 survey. The method for constructing the indicator was adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram).

Air Quality (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) gridded surface of the Socioeconomic Data and Applications Centre (SEDAC) Global Annual PM2.5 for 2016. Concentrations (micrograms per cubic meter) of ground-level fine particulate matter (PM2.5), with dust and sea-salt removed. Gridded data sets are provided as GeoTIFF files at 1x1km (2-3) and were further resampled to a 5x5 km gridded surface to be summarised.

Completed secondary education (women) (IHME) 2010 (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) gridded surface of the proportion of women aged 15 to 49 who have completed secondary education at the time of the survey, estimated by the Institute for Health Metrics and Evaluation (IHME) for years 2010 (4).

Completed secondary education (women) (IHME) 2015 (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) gridded surface of the proportion of women aged 15 to 49 who have completed secondary education at the time of the survey, estimated by the Institute for Health Metrics and Evaluation (IHME) for years 2015 (4).

Completed secondary education (women) (IHME) 2017 (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) gridded surface of the proportion of women aged 15 to 49 who have completed secondary education at the time of the survey, estimated by the Institute for Health Metrics and Evaluation (IHME) for years 2017 (4).

Nightlights (-MIN-MAX-MEAN-RANGE)

District level summaries from high-resolution (5x5km) gridded surface of nightlights. As a proxy of energy consumption, we used annual average satellite-derived nightlights radiance values, which are calculated for 2016 (5). The unit of radiance employed by the VIIRS DNB data is nanoWatts/cm2/sr. Original radiance values are multiplied by 1E9 in the source data. This dataset was obtained from a harmonized version by WorldPop (6) and was further resampled to a 5x5 km gridded surface to be summarised.

2. India_indicators.csv: Table (CSV) with data on the estimates of the different indicators at the district level in India found in the shapefile with the field name and aliases described above.

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Suggested citation

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Source data

This work is based on the India National Family Health Survey 4 (NFHS-4) - also called the 2015-16 India Demographic Health Survey (DHS) interchangeably. The 2015-16 India NFHS-4 were conducted by the Ministry of Health and Family Welfare (MoHFW), Government of India and International Institute for Population Sciences (IIPS), Mumbai, with the technical assistance of ICF through the DHS Program (funded by USAID). Microdata and more information can be found here: http://rchiips.org/nfhs/nfhs4.shtml and here: https://dhsprogram.com/. Indicators were adapted from the open-source code shared by the DHS Program Code Share Project (https://github.com/DHSProgram) (7). Other sources used in this work were: IHME (4), Nightlights (5-6) and Air Quality (2-3).

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