Goal 3: Ensure healthy lives and promote well-being for all at all ages

Target 3.b: Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all

Indicator 3.b.3: Proportion of health facilities that have a core set of relevant essential medicines available and affordable on a sustainable basis

Institutional information

Organization(s):

World Health Organization (WHO)

Concepts and definitions

Definition:

Proportion of health facilities that have a core set of relevant essential medicines available and affordable on a sustainable basis.

The indicator is a multidimensional index reported as a proportion (%) of health facilities that have a defined core set of quality-assured medicines that are available and affordable relative to the total number of surveyed health facilities at national level.

Rationale:

Measurement and monitoring of access to essential medicines are of high priority for the global development agenda given access is an integral part of the Universal Health Coverage movement and an indispensable element of the delivery of quality health care. Access to medicines is a composite multidimensional concept that is composed of the availability of medicines and the affordability of their prices. Information on these two dimensions has been collected and analysed since the 54th World Health Assembly in 2001, when Member States adopted the WHO Medicines Strategy (resolution WHA54.11). This resolution led to the launch of the joint project on Medicine Prices and Availability by WHO and the international non-governmental organization Health Action International (HAI/WHO), as well as a proposed HAI/WHO methodology for collecting data and measuring components of access to medicines. To this day, this methodology has been widely implemented to produce useful analyses of availability and affordability of medicines, however the two dimensions have been evaluated separately.

While the above approach has provided an overview of the countries' performance and progress on improving the affordability and availability of medicines, it has not allowed evaluation of overall access to medicines.

This evaluation is in turn essential as country's success in ensuring one of the dimensions (e.g. availability) does not necessarily indicate the realization of the other (e.g. affordability) and vice versa. For example, a country may focus its policy efforts on ensuring the availability of a core set of essential medicines in the event of low capacity of local production and/or challenges associated with geographic location. As a result of the proposed policies, medicines may become available but

their prices may not be affordable. The opposite situation is also possible, as lowering prices of medicines to increase affordability may be too restrictive for some pharmaceutical producers and lead to a decreased supply. Therefore, given the multidimensionality of access to medicines, it is necessary to evaluate both affordability and availability of medicines at the same time.

The proposed methodology for indicator 3.b.3 allows the combination of both dimensions into a single indicator to evaluate the availability and affordability of medicines simultaneously. This methodology also allows for disaggregation so that each dimension can be analysed separately and the main driver of poor performance of the overall index can be properly identified.

Monitoring the core set of relevant essential medicines is based on the WHO Model List of Essential Medicines (EML). The 2017 WHO EML contains 433 medications deemed essential for addressing the most important public health needs globally. The current index is computed based on a subset of 32 tracer essential medicines for the treatment, prevention and management of acute and chronic, communicable and non-communicable diseases in a primary health care setting.

Concepts:

Indicator 3.b.3 is defined as the "Proportion of health facilities that have a core set of relevant essential medicines available and affordable on a sustainable basis". This indicator is based on the proportion of facilities (pharmacies, hospitals, clinics, primary care centers, public/private, etc.) where core essential medicines from the identified set are available for purchase and their prices are affordable, compared to the total number of facilities surveyed.

There are several core concepts that are used for measuring indicator 3.b.3:

1) Availability of medicine
2) Affordability of medicine
   → to define affordability, additional concepts are used:
   - Daily dose treatment of the medicine
   - National poverty line
   - Wage of the lowest paid unskilled government worker
3) Core set of relevant essential medicines (defined on a global level)
   → to apply a core set of relevant essential medicines defined on a global level to all countries, an additional concept is used:
   - global burden of disease

1) A medicine is **available** in a facility when it is found in this facility by the interviewer on the day of data collection.[1] Availability is measured as a binary variable with 1 = medicine is available and 0 = otherwise.

2) A medicine is **affordable** when no extra daily wages (EDW) are needed for the lowest paid unskilled government sector worker (LPGW wage) to purchase a monthly dose treatment of this medicine after fulfilling basic needs represented by the national poverty line (NPL). Affordability is measured as a ratio of 1) the sum of the NPL and the price per daily dose of treatment of the medicine (DDD), over 2) the LPGW salary. This measures the number of extra daily wages needed to cover the cost of the medicines in the core set and that can vary between 0 and infinity.

2.a) Daily dose of treatment (DDD) is an average maintenance dose per day for a medicine used for its main indication in adults.[2] DDDs allow comparisons of medicine use despite differences in strength, quantity or pack size.

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[1] http://www.who.int/medicines/areas/access/OMS_Medicine_prices.pdf
[2] https://www.whocc.no/ddd/definition_and_general_considera/

2.b) National poverty line (NLP) is the benchmark for estimating poverty indicators that are consistent with the country's specific economic and social circumstances. NPLs reflect local perceptions of the level and composition of consumption or income needed to be non-poor.

2.c) W*age of the lowest paid unskilled government worker (LPGW)* is a minimum living wage that employees are entitled to receive to ensure overcome of poverty and reduction of inequalities.[3]

In other words, affordability of a medicine identifies how many (if any) extra daily wages are needed for an individual who earns the LPGW wage to be able to purchase a medicine. The computed EDW ratio aims to indicate whether the LPGW wage is enough for the individual who earns the lowest possible income to cover 1) the daily expenditures for food and non-food items used to define (relative or absolute) poverty using national standards (NPL) and 2) the daily needs for a medicine (DDD). This ratio then requires transformation into a binary variable where medicine is affordable when zero extra daily wages are required to purchase it and not affordable otherwise.

3) The <u>core set of relevant essential medicines</u> is a list of 32 tracer essential medicines for acute and chronic, communicable and non-communicable diseases in the primary health care setting.

This basket of medicines has been selected from the 2017 WHO Model List of Essential Medicines and used in primary health care. By definition, essential medicines are those that satisfy the priority health care needs of the population and are selected for inclusion on the Model List based on due consideration of disease prevalence, evidence of efficacy and safety, and consideration of cost and cost-effectiveness.

These medicines are listed in *table 1* of **Annex 1**, where a detailed justification for including each medicine is also provided, as well as online references for the relevant treatment guidelines and sections in the WHO List of Essential Medicines.

This list of medicines is intended as a global reference. However, to address regional and country specificities in terms of medicine needs, the medicines in this basket are weighted according to the regional burden of disease.

3.a) The *global burden of disease* is an assessment of the health of the world's population. More specifically, disease burden provides information on the global and regional estimates of premature mortality, disability and loss of health for causes. The summary measure used to give an indication of the burden of disease is the disability adjusted life years (DALYs), which represent a person's loss of the equivalent of one year of full health. This metric incorporates years of life lost due to death and years of life lost through living in states of less than full health (or disability).[4]

Comments and limitations:

1) **On basket of tracer essential medicines:**

1.1) Although it is possible to regularly monitor all 400+ medicines on the current WHO Model List of Essential Medicines, indicator 3.b.3 requires a specific subset of this list. Over the years, several baskets of medicines have been defined for different purposes and used to conduct data collection and monitor price and availability. This core set of medicines does not replace the other existing baskets, and WHO teams and partners are encouraged and committed to continue ad hoc monitoring through other existing channels. Throughout the process of identifying the core set of medicines, one area of focus has been to balance the selection of the tracer

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[3] https://www.ilo.org/global/topics/wages/minimum-wages/definition/lang--en/index.htm
[4] http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/

medicines for primary health care with the size of the basket itself. The proposed basket represents a balanced approach to allow that relevant tracer medicines for primary health care are monitored yet ensuring a practical and feasible data collection and analysis. The 32 medicines listed in the basket are meant to be indicative of the access to medicines for primary health care but do not serve as a complete or exhaustive list.

1.2) As mentioned above, each medicine in the basket is weighted according to the regional Disability Adjusted Life Years (DALYs) for relevant disease from the WHO Global health estimates. Regional estimates are less sensitive to country-by-country variability of data quality, they sufficiently illustrate the disease distribution across countries in the region and work well due simplicity and comparability. Hence, regional weights for medicines are used to establish the associated country weights. However, this diminishes the specificity of the basket to the national context.

2) On the measurement of medicines' availability:

The proposed approach for measuring the availability of medicines is based on the presence of the medicine on the day that the interviewer visits the facility and does not account for temporary and/or planned stock outs. The 32 medicines identified for the analysis should always be available in the facilities considering that in some (mainly rural) areas, the facility may be very difficult to reach and individuals may not have resources to travel on a daily basis. Moreover, in this proposed methodology the price of the medicine does not take into consideration the so-called indirect costs, which normally include transportation and other costs to reach the facility. Thus, the proposed measure for availability presents some limitations.

Furthermore, given the data collection occurs at the facility level and does not monitor quantities of any given medicine, an overall analysis of the available medicines compared to the national needs is not possible.

3) On the measurement of medicines' affordability:

3.1) Affordability of a medicine is often measured as the capacity of the population of a given country to pay for this medicine either ex-ante (usually based on income) or ex-post (usually based on reported expenditures). The latter would mainly require data collected at the individual level and from household surveys. However, information on medicine expenditures in these surveys is not always collected and when collected, is not done so consistently and regularly across the countries. In addition, there is usually a large amount of missing data.

The ex-ante approach is suggested for the purposes of this indicator as it is measured at the facility level. Ex-ante analysis requires identifying a reference person or group of people for the measurement. The lowest paid unskilled government worker is suggested to serve as the reference for this indicator. In other words, if a medicine is identified as being affordable for the individual who receives the LPGW wage, it will most likely be affordable for all other individuals affiliated with that economic group and higher. This obviously does not account for people employed in the unofficial labour market.

The proposed methodology is an adjusted HAI/WHO methodology. The HAI/WHO approach suggests computing the affordability of medicine prices as the number of daily wages that are required for the lowest paid unskilled government worker (LPGW) to purchase a daily dose of a medicine (DDD). This approach is straightforward and also refers to the capacity of the reference individual to pay for the medicines. However, no threshold was identified to distinguish the maximum number of daily wages that an individual must spend on a medicine in order to still be able to afford it.

3.2) Information on minimum LPGW wage is available by the International Labour Organization (ILO) for 155 countries. When information is missing or when information has not been updated recently, the alternative measure suggested is to be taken from the World Development Indicators data on

"minimum wage for a 19-year old worker or an apprentice", which is often used as an alternative in ILO reports.

3.3) The proposed indicator, being measured at the facility level, does not account for potential reimbursement schemes/insurance coverage present at the national level. Information about insurance or other forms of cost-coverage schemes at the national level is not readily available and would require standardization to allow for comparison across countries and income levels of the population. However, as demonstrated by the OECD in its Health at a Glance report in 2015, in 31 high- and middle-income countries the out-of-pocket (OOP) expenditures on pharmaceuticals as a share of all OOP on health varies from 64 to 16%.[5]

Moreover, there are other SDG indicators, such as 3.8.1 and 3.8.2 that capture coverage of essential health services as well as financial protection from health expenditures net of reimbursement, including expenditures for medicines.

4) Other dimensions on access to medicines (quality)

The quality of the product is another equally important dimension of access to medicines. Currently, there is no systematic and publicly available data collection on quality of a single medicine or in a single country. WHO has, however, contributed to enhanced access to quality health products through different programmes such as regulatory systems strengthening and prequalification.

A national regulatory authority (NRA) plays a key role in assuring the quality, safety, and efficacy of medical products until they reach the patient/consumer, as well as ensuring the relevance and accuracy of product information. Hence, stable, well-functioning and integrated regulatory systems are an essential component of a health system and contribute to better public health outcomes. NRA maturity and WHO prequalification of medicines can be considered as a proxy for ensuring that medicines in a country are of assured quality. The NRA maturity level is assessed using the WHO National Regulatory Authority Global Benchmarking Tool (WHO NRA GBT)[6]. After the evaluations, countries are assigned one of five levels of maturity[7], with a score of maturity level three representing the minimum acceptable regulatory capacity and maturity level five representing the highest level of functioning.

The importance of transparency and the disclosure of the results of assessments amongst regulators (from ML 3 up) are taken into consideration. However, the information on country-specific NRA maturity level is not currently publicly available and WHO is working to address this limitation through recent discussions on WHO Listed Authorities (WLA).

5) Other comments:

The "sustainability" dimension in this indicator can be measured only when more than one-time series of computations is available for a specific country so that a trend (tendency of a series of data points to move in a certain direction over time) can be identified.

The proposed methodology takes advantage of recognized standards and data collection methods, proposing a recombination of dimensions to allow measurement of affordability of a core set of relevant essential medicines for communicable and non-communicable diseases.

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[5] https://www.oecd-ilibrary.org/docserver/health_glance-2017-en.pdf?expires=1538398439&id=id&accname=ocid195767&checksum=5048DC3536CBC81347E991B01A182E2A

[6] http://www.who.int/medicines/regulation/benchmarking_tool/en/

[7] Maturity ranges between four levels starting from (1) some elements of regulatory systems exist; (2) evolving national regulatory system that partially performs essential regulatory functions; (3) stable well-functioning and integrated regulatory system; (4) regulatory system operating at advanced level of performance and continuous improvement.

Methodology

Computation Method:

The index is computed as a ratio of the health facilities with available and affordable medicines for primary health care over the total number of the surveyed health facilities:

$$SDG_{3.b.3} = \frac{Facilities\ with\ available\ and\ affordable\ basket\ of\ medicines\ (n)}{Surveyed\ Facilities\ (n)}$$

For this indicator, the following variables are considered for a multidimensional understanding of the components of access to medicines:

- A core set of relevant essential medicines for primary healthcare
- Regional burden of disease
- Availability of a medicine
- Price of a medicine
- Treatment courses for each medicine (number of units per treatment & duration of treatment)
- National poverty line and lowest-paid unskilled government worker (LPGW) wage
- Proxy for quality of the core set of relevant essential medicines.

The index is measured for each facility separately. Then a proportion of facilities that have accessible medicines is computed. The following **steps** must be taken to compute the index at the facility level:

1. Review and selection of the core basket of medicines for primary health care
2. Estimate weights for the defined medicines based on regional burden of disease
3. Measure the two dimensions of the access to medicine
   a. Availability
   b. Affordability
4. Combine the two dimensions on availability and affordability (access to medicines)
5. Apply weights to the medicine in the basket according to the regional prevalence of the diseases that are cured, treated, and controlled by these medicines
6. Identify whether a facility has a core set of relevant essential medicines available and affordable

The next two steps are calculated at the country level across all the surveyed facilities:

7. Calculate the indicator as the proportion of facilities with accessible medicines in the country
8. Consideration of the quality of the accessible medicines in the country using a proxy

Below is a more detailed procedure of the index computation.

Step 1: Review and selection of the core basket of medicines for primary health care

For some of the disease categories captured by the proposed basket of medicines, a therapeutic category of medicine has been specified (e.g. statins, beta blockers, corticosteroids, etc.) and a specific medicine must be identified for monitoring. For example, beclomethasone is used to treat non-communicable respiratory disease and if it is not supplied in a particular country for some policy or market reason, an alternative corticosteroid inhaler must be included in the analysis. In other cases, more than one medicine should be included in the basket per disease category. This will require a preliminary review of the basket before starting the data collection process.

Step 2: Estimate weights for the defined medicines based on regional burden of disease

The following points must be considered when computing medicines' weights:

i. Equal weights are assigned to medicines that are used to treat, cure, and control the same disease(s) (e.g. gliclazide (or other sulfonylurea), metformin and insulin regular are assigned equal weights according to the diabetes disease burden).

ii. For a medicine indicated for multiple diseases, DALYs values for each disease are summed.

iii. For a medicine used for treating conditions for children (four medicines from the list) sum of DALYs is computed for males and females at the age between 0 and 14 years.

iv. For some of the medicines which cannot be assigned to a specific disease (e.g. paracetamol) the weight is computed as $\frac{1}{T}$ (where T is a total number of medicines in the surveyed basket) assuming equal use of the medicine relative to other medicines in the core list.

v. For medicines not in the list but "suggested for monitoring" by the country, weight is computed as $0.5 * \frac{1}{T}$ assuming a minor relevance of these medicines for this indicator and to avoid major issues in inter-country comparison.

To estimate the weight for each medicine, the following steps have to be undertaken:

2.1 Assign each medicine in the basket to one or several disease(s) that are treated/cured/controlled by that medicine (*Annex 1 table 2*)

2.2 Assign to each disease the corresponding DALYs[8] (if several diseases are treated with the same medicine, compute sum of these DALYs accordingly) [$DALYs_{Mi}$]

2.3 Compute total sum of the DALYs per medicine [$\sum_{i=1}^{32} DALYs_{Mi}$]

2.4 Compute weight of each medicine as a proportion of the medicine specific DALYs to the total sum of DALYs in the basket [W_{Mi}]:

$$W_{Mi} = \frac{DALYs_{Mi}}{\sum_{i=1}^{32} DALYs_{Mi}}$$

As an example, the weights computed across regions for year 2015 are represented in **Annex 2 table 2.1 and 2.2.**

Step 3: Measure the two dimensions of access to medicine

Availability and *affordability* of medicines must be measured and transformed (when necessary) into the format of a binary variable.

a) *Availability* is measured as a binary variable coded as "1" when the medicine is in the facility on the day of the survey and coded as "0" otherwise. This approach is currently used in the HAI/WHO methodology.[9]

b) *Affordability* is computed following these steps:

3.1 Compute daily price per dose of treatment for each medicine (price per DDD) in the selected basket of medicines

WHO treatment guidelines provide the needed information to compute DDD.

DDD of a medicine is defined using the following formula:

$$price\ per\ DDD = \frac{Medicine\ price\ (month) * Units\ per\ treatment(month)}{365/12}$$

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[8] DALYs for a disease are calculated as the sum of the *Years of Life Lost (YLL)* due to premature mortality in the population and the *Years Lost due to Disability (YLD)* for people living with the health condition or its consequences (DALYs YLL + YLD). That is why DALYs allow "calculating" consequences both from acute diseases (mortality) and from chronic diseases (disability and life with disease). http://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html

[9] http://www.who.int/medicines/areas/access/OMS_Medicine_prices.pdf

where:

- ➢ Units per treatments are tablets/vials or other forms that are needed for an individual with the average severity of the disease per one course of treatment of a duration of one month (365 days per year / 12 months per year = 30.42 days given 30 or 31 day per month), and
- ➢ Medicine prices are calculated per unit (per tablet/vial/other form) requiring adjustments for gram or milligram according to the potency.

This ratio varies between "0" and infinity and is measured in local currency units per day [LCU/d].

Information on the number of units per treatment is specified in **Annex 3**. The price per DDD can be measured in per day or per month.

3.2 Define National poverty line (NPL) and minimum wage of the LPGW for the analysed country

National poverty line (NLP): countries periodically recalculate and update their poverty lines based on new survey data and publish this information in their national reports on poverty. To adjust the latest available NPLs to the relevant year of analysis (when needed) information on the Consumer Price Index (CPI) in the analysed country has to be used to account for deflation/inflation.

National poverty reports consistently provide information on the NPLs in local currency units but often refer to different recall periods from country to country (NPL can be measured per day, per month or per year). For consistency, NPL has to be adjusted to be measured per day [LCU/d].

The wage of the lowest paid unskilled government worker (LPGW): is estimated and published in the ILOSTAT database. For countries with the latest available data collected in a year different from the year of analysis, LPGW wage is actualised using the CPI conversion factor.

ILO provides information on the minimum LPGW wages in local currency units per month. LPGW wage has to be adjusted to be measured per day as well [LCU/d].

The NPL and LPGW wage can be measured in per day or per month.

3.3 Compute extra daily wages (EDW)

First, the LPGW wage is compared to the NPL and if it is lower, medicine is considered unaffordable. In this case, only medicines with a price equal to zero will be considered affordable.

Next, the affordability is measured via the number of extra daily wages (EDW) that are needed for the LPGW to pay for one-month course of treatment using the formula below. In particular, the number of extra daily wages can be computed using the following formula:

$$Extra\ daily\ wages\ (EDW) = \frac{NPL + price\ per\ DDD}{daily\ wage\ of\ LPGW}$$

3.4 Transform EDW variable into a binary format

Following the definition, medicine is considered to be affordable when the sum of NPL and price of a daily dose of the treatment is equal to or less than the minimum daily wage of the LPGW:

$$\begin{cases} if\ EDW\ \leq 1, & affordability = 1, \\ otherwise, & affordability = 0 \end{cases}$$

Hence, the affordability of medicines is also measured as a binary variable that is coded as "1" when the medicine is affordable and "0" otherwise.

When the price of the medicine is 0, there is no need for the above-mentioned computations and the medicine is considered affordable (i.e. "1"). If all medicines in the country are provided free of charge, all medicines are directly marked as affordable and further computation of the index depends on the availability of these medicines.

Step 4: Combine the two dimensions on availability and affordability (access to medicines)

In this step, the two dimensions of access to medicines (availability and affordability) are combined into a multidimensional index.

The construction of a multidimensional index is based on the union identification approach[10] proposed by S. Alkire and G. Robles.

The combination of the dimensions of medicines can be built in matrix form:

$$g_{ij}^o = \begin{bmatrix} x_{11} & \dots & x_{1d} \\ \dots & \dots & \dots \\ x_{n1} & \dots & x_{nd} \end{bmatrix}$$

This matrix contains performance for n objects of analysis (specified in rows) in d dimensions (specified in columns). The performance of any object i in all d dimensions is represented by the d-dimensional vector x_i for all $i = 1, \dots, n$. The performance in any dimension j for all n objects are represented by the n-dimensional vector x_j for all $j = 1, \dots, d$. Overall, an index should be computed via two main steps: identification and aggregation. An example of how to combine the 2 dimensions can be found in **Annex 4**.

Step 5: Apply weights to the medicine in the basket according to the regional prevalence of the diseases that are cured/treated/controlled by these medicines

After identifying the access variable, medicines in the basket have to be weighted according to the prevalence of the disease(s) that these medicines are used to cure/treat/control using the weights identified in **step 2** and provided in **Annex 2, tables 2.1 and 2.2.** This is performed by multiplying the access variable with the medicine weights:

Figure 1. Achievement matrix of weighted access to medicine

$$X'' = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} * \begin{pmatrix} w_{m1} \\ w_{m2} \\ w_{m2} \end{pmatrix}; \quad X'' = \begin{pmatrix} w_{m1} \\ 0 \\ 0 \end{pmatrix}$$

Access   Weights   Weighted access

Step 6: Identify whether a facility has a core set of relevant essential medicines available and affordable

The following computations must be undertaken in this step:

6.1 Calculate proportion of medicines that are accessible (both available and affordable) in each facility

Because medicines are weighted, the proportion is computed as a weighted sum of medicines that are both available and affordable (accessible) in each facility using the following formula:

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[10] https://www.ophi.org.uk/wp-content/uploads/OPHIRP046a.pdf

$$Access = \sum_{i=1}^{n} w_{mi}$$

This variable is then transformed into a percentage and varies from 0 to 100.

The computed number of accessible medicines accounts for the importance of the analysed medicines in the country. In particular, if a medicine with a higher weight (for example hypertension) is not accessible, the index will be sensitive to this and will demonstrate the lack of access. On the contrary, if a medicine has a low weight (i.e. approaching zero, such as antimalarial medication in a non-endemic country) and is not accessible, the index will not be affected.

6.2 Mark facilities that have 80% or more of available and affordable medicines

The computed variable "access" is then transformed into the binary format identifying facilities that have the core basket of essential medicines available and affordable versus facilities that do not. A threshold of 80% is applied in order to transform the "access" variable into a binary format. In particular, at least 80% of all the medicines surveyed in a facility have to be both available and affordable. The transformation is made using the following formula:

$$\begin{cases} if\ Access_{facility_i} \geq 80\%\ Facility = 1, \\ \\ otherwise, Facility = 0 \end{cases}$$

This threshold is agreed upon and adopted by the WHO Global Action Plan on Non-Communicable Diseases and used as a reference in this proposed methodology.

Step 7: Calculate the indicator as the proportion of facilities with accessible medicines in the country

The proportion of facilities that have reached the 80% threshold is calculated out of the total number of surveyed facilities in a selected country using the following formula:

$$SDG_{3.b.3} = \frac{Facilities\ with\ available\ and\ affordable\ basket\ of\ medicines\ (n)}{Surveyed\ Facilities\ (n)}$$

The computed indicator is a proportion that will then be converted into a percentage between 0-100%.

Step 8: Consideration of quality of the accessible medicines in the country using a proxy

The country level of medicine regulatory capacity assessed using the WHO NRA GBT is used as a proxy of the quality of the accessible medicines. The countries with a WHO Listed Authority (WLA corresponding to maturity level 3 and above) will be flagged to indicate the assured quality component.

Disaggregation:

The proposed indicator will allow for the following disaggregation:

1) public/private/mission sectors facilities (managing authority)
2) geography – rural/urban areas
3) therapeutic group
4) facility type (pharmacy/hospital)
5) medicine.

Treatment of missing values:

- At country level

Treatment of missing values has already been partially addressed. In particular, when a medicine is not available, its price cannot be collected. For this reason, missing price values are considered as the medicine not being available and therefore not accessible (access = 0).

Observing missing values for availability and affordability simultaneously indicates that these medicines are not provided at all in the surveyed facility. For example, in some countries medicines for in-patient care (mostly in injectable forms) are provided only in hospitals. In this case, the procedure for computing the indicator is the same except that:

1) Medicines that are used for inpatient care are excluded from the analysis of the data collected in pharmacies and other non-tertiary health care facilities, and
2) Two different versions of weights are applied to the list of medicines for hospitals and for pharmacies.

- At regional and global levels

When computing regional or global aggregates of indicator 3.b.3, it is possible to accommodate missing values from countries resulting from a lack of data collection for a given country in a given year. In order to calculate a regionally aggregated 3.b.3 indicator, a 5-year period of data collection will be used as a reference to identify the available indicators for all the countries in the region. If during the defined 5-year period, one country of the region does not have even one indicator result, this country will not be included in the regional aggregate. The missing values from the countries can only be imputed when at least one data point exists for the given country in such a 5-year period.

Regional aggregates:

Regional and global aggregates can be computed using national population size of a country as a proxy for the country weights in the region or globally. This is justified because medicines must be available and affordable for every individual in the population.

To compute the regional indicator, the weighted average of the country indicators (using either the actual national indicator when available for the specific year of calculation, or the imputed value that corresponds to the year closest to the year of calculation) is used.

Sources of discrepancies:

Data can be received from three data sources: SARA, HAI/WHO, and the EMP MedMon. These data collection methods demonstrate the following discrepancies:

a) Sampling of the facilities to be surveyed,
b) Size of the sampling of the facilities to be surveyed, and
c) Questions asked at facility level to capture availability (i.e. SARA considers potentially available expired medicines as well).

WHO will use any of these three data sources available for the year of calculation as a compromise between the limitations that these discrepancies pose to the proposed methodology and the need to overcome data availability issues in order to start reporting on this critical indicator. In the unlikely case that data is available through more than one data source for a specific country, WHO will rely on the source with a larger sample size and a higher percentage of medicines from the defined core list captured by the survey.

Methods and guidance available to countries for the compilation of the data at the national level:

The HAI/WHO manual on measuring medicine prices, availability, affordability and price components describes the methodology as well as the guidelines for the data collection procedure and analysis of the availability and affordability of medicines on the facility and national level:

http://www.who.int/medicines/areas/access/medicines_prices08/en/

http://www.who.int/healthinfo/systems/SARA_Reference_Manual_Full.pdf

http://www.who.int/medicines/areas/policy/monitoring/empmedmon

Quality assurance

Quality control can be performed based on the median availability and median consumer price ratio of selected generic medicines listed on the Global Health Observatory (GHO)[11]. The quality of the key components of this indicator (i.e. availability, prices, etc.) can be assured for data collected using any of the three mechanisms listed above when cross-referenced with the GHO values.

For future data collection, quality will be based on the analysis of the sample size and the number of medicines captured in the basket.

Countries will collect and share data with the WHO Secretariat. WHO will subsequently compute the indicator and return to the countries for validation. By request, WHO will also provide all background materials and training for data collection and indicator computation.

Data Sources

Description:

The indicator relies on three data sources that have been used by countries to collect information on medicine prices and availability:

1) Health Action International Project supported by the WHO **[HAI/WHO]**
2) The Service Availability and Readiness Assessment survey **[SARA]**
3) The WHO Medicines Price and Availability Monitoring mobile application **[EMP MedMon]**

Health Action International Project supported by WHO **[HAI/WHO]** provides data from national and sub-national surveys that have used the WHO/HAI methodology, Measuring Medicine Prices, Availability and Affordability and Price Components. The database is available at the following link: http://haiweb.org/what-we-do/price-availability-affordability/price-availability-data/

The Service Availability and Readiness Assessment **[SARA]** is a health facility assessment tool designed to assess and monitor availability and readiness of the services provided in the health sector and to generate evidence to support the planning and managing of a health system.

The WHO Medicines Price and Availability Monitoring mobile application **[EMP MedMon]** can be considered as an updated version of the HAI/WHO tool for collecting data on medicine prices and availability. This data collection tool was created based on the two previously mentioned existing and well-established methodologies. This application is used at facility level to collect information on availability and price of the agreed-upon core basket of medicines.

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[11] http://apps.who.int/gho/data/node.main.487

The EMP MedMon is easier to use, faster to conduct and consumes much fewer resources for collecting data. It also allows for a modular approach to defining the basket, which is highly useful and convenient for the purposes of this indicator.

In order to compute historical data points prior to 2018, data from HAI/WHO is used. To compute current and future data points, SARA and EMP MedMon are recommended.

Collection process:

Availability and affordability of medicines

WHO obtains SARA survey data on availability and affordability from the countries' Ministries of Health (MoH). HAI/WHO historical data collected at the facility level is available from HAI by request, as publicly available HAI/WHO data on the HAI website has already aggregated at the country level. The EMP MedMon data on availability and medicine prices is collected in collaboration between WHO and Ministries of Health of the countries.

NPLs, LPGW wages, DALYs:

National poverty reports consistently provide information on the *NPLs* in local currency units. The updated and recalculated NPLs are also published by the countries in these poverty reports. The *wage of the LPGW* is published in the ILOSTAT database. Information regarding the *regional burden of diseases (DALYs)* is publicly available and published by WHO.

Data Availability

Description:

SARA: 21 national surveys are currently available from 2010 to 2017 for a total of 13 countries. Two- and three-year trends are available for six countries; the other seven countries only have one data point. 67% of the SDG basket of relevant essential medicines is covered by such surveys. These data will be used to test quality on the availability dimension only.

HAI/WHO: Historical data points are available for 55 countries (28%) of all WHO Member States. The highest number of countries captured by the surveys is in the SEARO region (59%) and the smallest is in EURO region (15%). More than 60% of the medicines from the defined SDG indicator basket are captured in the HAI/WHO historical data surveys.

Table 1. Number of countries captured by the surveys across regions

WHO Region	2001-2005	2005-2010	2010-2015	Total
African Region	14	5	2	**21**
Region of the Americas	3	7	1	**11**
Eastern Mediterranean Region	8	5	3	**16**
European Region	5	2	3	**10**
South-East Asia Region	5	2	1	**8**
Western Pacific Region	6	2	2	**10**
Total	**41**	**23**	**12**	**76**

HAI/WHO surveys were conducted more than once in some of the countries for a total of 76 surveys.

EMP MedMon: In 2016 the design of the EMP MedMon tool for data collection was finalised. Since then, several pilot surveys have been conducted to test the tool. The first pilot survey was conducted across 19 countries using a basket of medicines that captures around 60% of the one currently proposed. The second pilot used a basket adjusted for the purposes of capturing non-communicable diseases only. These pilots have demonstrated that this tool is flexible and can be easily manipulated to include specialized modules of medicines for future data collection.

Time series:

Existing data has been historically collected based on available funding. The majority of existing surveys have been collected thus far using the **HAI/WHO** data collection tool. Most of the existing data points are from 2000 – 2005.

Table 2. Number of surveys and % of medicines from the defined basket

that are captured by HAI/WHO surveys

	2001-2005	2005-2010	2010-2015
Total number of surveys (n)	41	23	12
Medicines captured in the surveys (%)	49.8%	66.3%	72.9%

The distribution of these 76 surveys across WHO regions is represented in **Table 3.**

Table 3. Number of HAI/WHO surveys across regions

WHO Region	Number of countries captured in the surveys	Ttl number of countries	% of covered countries
African Region	16	47	34%
Region of the Americas	9	35	26%
Eastern Mediterranean Region	13	22	59%
European Region	8	54	15%
South-East Asia Region	4	11	36%
Western Pacific Region	5	27	19%
Total	**55**	**196**	**28.1%**

Overall 21 **SARA** surveys were conducted over the period from 2010 to 2017. 17 surveys were conducted between 2010 and 2015 and 4 surveys after 2015.

Calendar

Data collection:

SARA & HAI/WHO: Data collection activities have often been conducted using funds from international donors.

EMP MedMon: Data collection activities have been conducted using funds from international donors, but WHO is currently testing a sustainable regular monitoring mechanism through the integration of similar data collection during government inspection of health facilities or using country-determined sentinel monitoring sites.

Data release:

Based on historical data points, the first release of the SDG indicator 3.b.3 results is planned for the summer of 2019. Subsequently, updated values will be calculated and published on an annual basis.

Data providers

SARA, HAI/WHO, EMP MedMon: Data is collected by the countries' Ministries of Health (MOH), often with the support of the WHO country office. Data is then validated by MoH-based statisticians and shared with WHO by request.

Data compilers

The World Health Organization

References

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4. World Health Organization, *The Global Burden of Disease: 2004 Update* (Switzerland, 2008), available from http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/
5. "WHO Global Benchmarking Tool (GBT) for evaluation of national regulatory systems" (WHO Essential medicines and health products, 2018), available from http://www.who.int/medicines/regulation/benchmarking_tool/en/.
6. "Disease burden and mortality estimates" (WHO Health statistics and information systems, 2018), available from http://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html.
7. Alkire, S. and Robles, G. (2016). "Measuring multidimensional poverty: Dashboards, Union identification, and the Multidimensional Poverty Index (MPI)." OPHI Research in Progress 46a, University of Oxford.
8. "Essential Medicines" (WHO Global Health Observatory data repository, 2016), available from http://apps.who.int/gho/data/node.main.487.
9. Health at a Glance 2017: OECD Indicators, OECD (2017). OECD Publishing, Paris https://doi.org/10.1787/health_glance-2017-en.

Related SDG indicators

3.b.1- Proportion of the target population covered by all vaccines included in their national programme

3.b.2- Total net official development assistance to medical research and basic health sectors

3.8.1- Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health,

infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)

3.8.2- Proportion of population with large household expenditures on health as a share of total household expenditure or income

Annex 1: Basket of core set of relevant essential medicines for primary health care and related disease category

Table 1. Basket of core set of relevant essential medicines for primary health care

Medicine	Category (Therapeutic group)	Justification
Salbutamol (100 mcg/dose inhaler)	NCD - Respiratory	**Rationale:** Salbutamol, a short acting beta-2 agonist, is recommended for prophylaxis and the first-line treatment of bronchospasm in asthma and COPD. It is recommended for all patients with acute severe asthma. **Treatment References:** WHO PEN 5.b, WHO Guidelines for primary health care in low-resource settings **More information in WHO EML 2017 Section Reference:** 25.1
Beclometasone (100 mcg/dose inhaler) or other corticosteroid inhaler Alternatives would include, but not be limited to, budesonide, fluticasone, ciclesonide. Refer to ATC group R03BA -	NCD - Respiratory	**Rationale:** Inhaled corticosteroids are indicated for maintenance treatment of asthma symptoms by reducing inflammation and reducing airways hyper-responsiveness. These do not provide symptomatic relief in acute asthma. Beclometasone is a representative antiasthmatic in the WHO EML. **Treatment References:** WHO PEN 5.b, WHO Guidelines for primary health care in low-resource settings **More information in WHO EML 2017 Section Reference:** 25.1
Gliclazide (80 mg cap/tab) or other sulfonylurea Alternatives would include but not be limited to glibenclamide, glimepiride. Refer to ATC group A10BB	NCD - Diabetes	**Rationale:** Second generation sulfonylureas (SFUs) increase the release of insulin from the pancreas to relieve the hyperglycaemia associated with diabetes. SFUs are useful in patients unable to tolerate metformin, or not adequately controlled on metformin. These are among the main therapies for most patients with type 2 diabetes, but contraindicated for patients with type 1 diabetes. However, it should be noted that glibenclamide has associated with higher levels of hypoglycaemia compared with gliclazide. Gliclazide is the representative sulfonylurea in the WHO EML. **Treatment References:** WHO PEN 5.b, WHO Guidelines for primary health care in low-resource settings **More information in WHO EML 2017 Section Reference:** 18.5
Metformin (500 mg cap/tab, 850 mg cap/tab or 1 g cap/tab)	NCD - Diabetes	**Rationale:** Metformin, an oral anti-diabetic medicine, can be used in patients with type 2 diabetes as a monotherapy or in combination with sulfonylureas. **Treatment References:** WHO PEN 5.b, WHO Guidelines for primary health care in low-resource settings **More information in WHO EML 2017 Section Reference:** 18.5
Insulin regular, soluble (100 IU/ml injection)	NCD - Diabetes	**Rationale:** Regular human insulin, a rapid acting insulin, is necessary for all patients with type 1 and more than 10% of patients with type 2 diabetes. It is currently more affordable to health systems than other long-

		acting or analogue insulins. **Treatment References:** WHO PEN 5.b **More information in WHO EML 2017 Section Reference:** 18.5

Two of the following antihypertensive:
   1. Amlodipine (5 mg cap/tab)
   2. Enalapril (5 mg cap/tab) or other angiotensin converting enzyme inhibitor (ACEI). Refer to ATC group C09AA.
   3. Hydrochlorothiazide (25 mg cap/tab) or Chlorthalidone (25 mg cap/tab)
   4. Bisoprolol (5 mg cap/tab) or alternative betablocker (atenolol or carvedilol or metoprolol only)
	NCD - Cardiovascular	**Rationale:**
		Calcium channel blockers (CBB) are among the first-line treatment options for patients with hypertension. Amlodipine is the representative CCB in the WHO EML. ACEIs are among first-line treatment options for patients with hypertension. ACEIs are also used in the management of heart failure. Enalapril is the representative ACEI in the WHO EML.
		Thiazide diuretics are among the first-line treatment options for patients with hypertension. Thiazides are also used as the management of heart failure. Hydrochlorothiazide is the representative thiazide diuretic in the WHO EML.
		Beta-blockers are among the recommended treatment options for patients with hypertension, angina, cardiac arrhythmias or heart failure. Bisoprolol is the representative beta-blocker in the WHO EML.
		Treatment References: WHO PEN 5.b, WHO Guidelines for primary health care in low-resource settings
		More information in WHO EML 2017 Section Reference: 12.3, 12.4

Simvastatin (20 mg cap/tab) or other statin. Refer to ATC group C10AA.	NCD - Cardiovascular	**Rationale:** Statins, lipid-lowering medicines, are used to reduce the risk of coronary heart disease, including fatal and non-fatal myocardial infarction and stroke. Simvastatin is the representative statin in the WHO EML. **Treatment References:** WHO PEN 5.b, WHO Guidelines for primary health care in low-resource settings **More information in WHO EML 2017 Section Reference:** 12.6
Acetylsalicylic acid (aspirin) (100 mg cap/tab)	NCD – Cardiovascular	**Rationale:** Aspirin, an anti-platelet medication, is recommended for preventing a first stroke, has an important role in preventing recurrent strokes, and can reduce the severity of an ischemic stroke. Low-dose aspirin has numerous therapeutic indications including anti-platelet therapy and can be used to reduce the risk of cardiovascular disease. **Treatment References:** WHO PEN 5.b **More information in WHO EML 2017 Section Reference:** 12.5
Furosemide 40 mg tablet	NCD - Cardiovascular	**Rationale:** Furosemide is a loop diuretic used in the treatment of oedema, congestive heart failure, and kidney disease. **Treatment References: WHO PEN 5.b** **More information in WHO EML 2017 Section Reference:** 12.4
Morphine (10mg tablet)	Palliative care	**Rationale:** Morphine, an opioid analgesic, is the first-choice opioid for treatment of strong pain, including cancer pain. It is also recommended as a preoperative medication and sedation for short-term procedures. **Treatment References:**

		WHO Model Prescribing Information: Drugs Used in Anaesthesia **More information in WHO EML 2017 Section Reference:** 2.2,1.3
Paracetamol (any strength)	Pain and Palliative Care	**Rationale:** Paracetamol, also referred to as acetaminophen or APAP, is an analgesic and antipyretic that is used widely as a first-line treatment for mild to moderate pain and fever. It is also often found in combinations with other medications to treat a cold or for severe pain. In particular, it is the preferred analgesic for pregnant women. **Treatment References:** WHO Model Prescribing Information: Drugs Used in Anaesthesia **More information in WHO EML 2017 Section Reference:** 2.1, 7.1
Fluoxetine (20 mg cap/tab) or other selective serotonin reuptake inhibitor (SSRI)	CNS	**Rationale:** SSRIs are among the most widely used drugs in the treatment of depressive disorders. Fluoxetine is recommended for use in depressive disorders and can be used to treat patients over 8 years old. SSRIs should be used as part of a comprehensive management plan. **Treatment References:** Evidence-based recommendations for management of depression in non-specialized health settings **More information in WHO EML 2017 Section Reference:** 24.2
Phenytoin (100mg Tablet) or Carbamazepine (200 mg cap/tab)	CNS	**Rationale:** Carbamazepine and phenytoin are anticonvulsant/antiepileptic medicines used in the management of generalized and partial seizures and neuropathic pain. **Treatment References:** Evidence-based recommendations for management of epilepsy and seizures in non-specialized health settings **More information in WHO EML 2017 Section Reference:** 5
Gentamicin (40 mg/mL in 2mL vial)	Anti-infective	**Rationale:** Gentamicin, an aminoglycoside antibiotic, is used for the systemic treatment of susceptible infections. It is classified as an ACCESS antibiotic in the WHO EML, signifying that it should widely available, affordable, and quality assured. It is the first-line treatment for community acquired pneumonia, complicated severe malnutrition, and neonatal sepsis, and second-line treatment for gonorrhoeae. **Treatment References:** WHO Model Prescribing Information: Drugs used in Bacterial Infections **More information in WHO EML 2017 Section Reference:** 6.2.2
Amoxicillin (500mg cap/tab)	Anti-infective	**Rationale:** Amoxicillin, a beta-lactam antibiotic, is used to treat a wide range of susceptible infections. It is classified as an ACCESS antibiotic in the WHO EML, signifying that it should widely available, affordable, and quality assured. It is the first-line treatment for specific infectious syndromes, including community acquired pneumonia, neonatal sepsis, lower urinary tract infections, and the second-line treatment for acute

		bacterial meningitis. **Treatment References:** WHO Model Prescribing Information: Drugs used in Bacterial Infections **More information in WHO EML 2017 Section Reference:** 6.2.1
Ceftriaxone (1g/vial Injection)	Anti-infective	**Rationale:** Ceftriaxone, a third generation cephalosporin, is used for the systemic treatment of susceptible infections. It is classified as a WATCH in the WHO EML, signifying it higher resistance potential and recommendation for only a specific, limited number of indications. It is the first-line treatment for specific infectious syndromes including severe community acquired pneumonia, acute bacterial meningitis, and gonorrhoeae. **Treatment References:** WHO Model Prescribing Information: Drugs used in Bacterial Infections **More information in WHO EML 2017 Section Reference:** 6.2.1
Procaine benzylpenicillin (1G = 1MU Injection) or Benzathine benzylpenicillin (900mg=1.2 MIU or 1.44g = 2.4MIU) injection	Anti-infective	**Rationale:** Procaine benzylpenicillin, a beta-lactam antibiotic, is used to treat syphilis in adults and children. It is classified as an ACCESS antibiotic in the WHO EML, signifying that it should widely available, affordable, and quality assured. **Treatment References:** WHO Model Prescribing Information: Drugs used in Bacterial Infections **More information in WHO EML 2017 Section Reference:** 6.2.1
One of the following contraceptives: 1. Ethinylestradiol + levonorgestrel: tablet 30 mcg + 150 mcg (or alternative combined oral contraceptive) 2. Levonorgestrel 30 microgram tablet. 3. Medroxyprogesterone acetate injection IM 150 mg/mL or SC 104 mg/0.65mL 4. Progesterone-releasing implant (etonogestrel 68 mg or levonorgestrel 150 mg) 5. Levonorgestrel 750 mcg or 1.5 mg tablet	MCH	**Rationale:** Promotion of family planning – and ensuring access to preferred contraceptive methods for women and couples – is essential to securing the well-being and autonomy of women, while supporting the health and development of communities. Access to contraceptives can reduce infant and maternal mortality rates associated with closely spaced and ill-timed pregnancies. Additionally, contraceptives have be included on the WHO EML since its inception and are also listed as life-saving commodities by the UN Commission on Life-Saving Commodities for Women and Children. **Treatment References:** Medical eligibility criteria for contraceptive use **More information in WHO EML 2017 Section Reference:** 18.3
Oral rehydration (salts 1 litre)	MCH	**Rationale:** Oral rehydration salts (ORS), solutions containing sodium, potassium, citrate, and glucose, are used to replace fluid and electrolytes orally. ORS is used to treat acute diarrhoea in children to prevent or treat dehydration. **Treatment References:** Diarrhoea treatment guidelines including new recommendations for the use of ORS and zinc supplementation for clinic-based healthcare workers **More information in WHO EML 2017 Section**

		Reference: 26.1
Zinc sulphate (20mg dispersible tablet)	MCH	**Rationale:** Zinc supplements are recommended to reduce the severity and duration of acute diarrhoea. If given for 10 to 14 days, zinc also reduces the incidence of new episodes of diarrhoea in the 2 to 3 months following treatment. **Treatment References:** Diarrhoea treatment guidelines including new recommendations for the use of ORS and zinc supplementation for clinic-based healthcare workers **More information in WHO EML 2017 Section Reference:** 17.5.2
Oxytocin (5iu or 10iu injection)	MCH	**Rationale:** Oxytocin, a peptide hormone, is used for the prevention and treatment of postpartum and post-abortion haemorrhage in emergency situations. It is the recommended that all women giving birth should be offered uterotonic drugs, such as oxytocin, during the third stage of labour for the prevention of PPH. **Treatment References:** WHO Recommendations for the Prevention and Treatment of Postpartum Haemorrhage, UNFPA Medicines for Maternal Health **More information in WHO EML 2017 Section Reference:** 22.1
Magnesium sulphate 50% 10ml Injection	MCH	**Rationale:** Magnesium sulfate, an anticonvulsant, is used in the management and prevention of recurrent seizures in eclampsia and pre-eclampsia. **Treatment References:** WHO recommendation on magnesium sulfate for the prevention of eclampsia in women with severe pre-eclampsia, UNFPA Medicines for Maternal Health **More information in WHO EML 2017 Section Reference:** 5
Folic acid	MCH	**Rationale:** Single-agent folic acid is important for the prevention of neural tube defects and should be taken periconceptionally and in first trimester of pregnancy. **Treatment References:** WHO recommendation on periconceptional folic acid supplementation to prevent neural tube defects **More information in WHO EML 2017 Section Reference:** 10.1
Artemisinin-based combination therapy (ACT) for treatment of uncomplicated *P. falciparum* malaria. One of the following: 1. Artemether+lumefantrine (20/120 mg cap/tab) 2. Artesunate+amodiaquine (any strength) 3. Artesunate+mefloquine (any strength) 4. Dihydroartemisinin+piperaquine (any strength)	Anti-malarial	**Rationale:** WHO Guidelines recommend treating adults and children with uncomplicated *P. falciparum* malaria with artemisinin-based combination therapy (strong recommendation, high-quality evidence). **Treatment References:** WHO Guidelines for the Treatment of Malaria **More information in WHO EML 2017 Section Reference:** 6.5.3.1

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5. Artesunate+sulfadoxine-pyrimethamine (50 mg+500mg/25mg)		
Artesunate (60 mg injection or 100 mg rectal dose form)	Anti-malarial	**Rationale:** IM or rectal artesunate is recommended pre-referral treatment of suspected cases of severe malaria pending transfer to a higher level facility. **Treatment References:** WHO Guidelines for the Treatment of Malaria **More information in WHO EML 2017 Section Reference:** 6.5.3.1
Combination anti-retroviral therapy for first line treatment of HIV One of the following combinations individually for concomitant use or in fixed-dose combination: 1. Efavirenz (400 mg or 600 mg) + Emtricitabine (200 mg) + Tenofovir disoproxil fumarate (300 mg) 2. Efavirenz (400 mg or 600 mg) + Lamivudine (300 mg) + Tenofovir disoproxil fumarate (300 mg)	Antiretroviral	**Rationale:** Efavirenz/Emtricitabine/Tenofovir is the preferred fixed-dose combination antiretroviral therapies for treatment of HIV in adults, pregnant or breastfeeding women, and adolescents. **Treatment References:** WHO Consolidated Guidelines on the Use of Antiretroviral Drugs for Treating and Preventing HIV Infection **More information in WHO EML 2017 Section Reference:** 6.4.2.4
Ibuprofen (200mg tablet)	Pain and Palliative Care	**Rationale:** Ibuprofen, a non-steroidal anti-inflammatory drug, is a first choice medicine in the treatment of mild pain. **Treatment References:** WHO Guidelines on the pharmacological treatment of persisting pain in children with medical illnesses **More information in WHO EML 2017 Section Reference:** 2.1
Chlorhexidine Solution or gel: 7.1% (digluconate) delivering 4% chlorhexidine	Neonatal care	**Rationale:** A recommended antiseptic that should be applied to the umbilical cord in cases of unclean delivery, and if the traditional practices in place increase the risk of cord infection **Treatment References:** Review of the available evidence on 4% chlorhexidine solution for umbilical cord care **More information in WHO EML 2017 Section Reference:** 29.1
Ready-to-use therapeutic food (RUTF), paste or spread (1 sachet = 92 g [500 Kcal]) or biscuit (28.4g, 500 kcal per 100g)	Nutrition	**Rationale:** Energy-dense, micronutrient enhanced pastes used in therapeutic feeding for the community-based management of children who are suffering from uncomplicated severe acute malnutrition and who retain an appetite. Is provided as the therapeutic food in the rehabilitation phase (following F-75 in the stabilization phase) **Treatment References:** WHO Guideline: Updates on the management of severe acute malnutrition in infants and children. 2013 **More information in WHO EML 2017:** Not currently included
Isoniazid + pyrazinamide + rifampicin (50 mg + 150 mg + 75 mg)	Antituberculosis	**Rationale:** Isoniazid + pyrazinamide + rifampicin is recommended as fixed-dose combination therapy for the intensive phase of treatment of drug-susceptible tuberculosis in children. **Treatment References:** Guidance for national

		[tuberculosis programmes on the management of tuberculosis in children, 2014](#) **More information in WHO EML 2017 Section Reference:** 6.2.4
Erythropoiesis - stimulating agents. One of the following: 1. Epoetin alfa (2,000 IU/mL) 2. Darbepoetin alfa (100 mcg/mL)	Chronic kidney disease	**Rationale:** Erythropoiesis-stimulating agents are recommended for treatment of anaemia of chronic kidney disease in children, young people and adult patients with chronic renal disease requiring dialysis. **Treatment References:** [WHO EML 2016-2017 - Application for erythropoietin-stimulating agents (erythropoietin type blood factors)](#) **More information in WHO EML 2017 Section Reference:** 10.1
<td colspan="3" align="center">**Suggested for monitoring (optional for countries) ***</td>		
One of the following: 3. Epinephrine injection 1 mg (as hydrochloride or hydrogen tartrate) in 1- mL ampoule 4. Dexamethasone injection 4 mg/ mL in 1- mL ampoule (as disodium phosphate salt)	Antiallergics and medicine used in anaphylaxis	**Rationale:** Epinephrine (adrenaline) is the first line treatment for a severe allergic reaction. During anaphylactic shock, it must be administered through an intramuscular injection. Dexamethasone is a corticosteroid that prevents almost all symptoms of inflammation associated with allergy. It can also be used during emergency anaphylactic shock. **Treatment References:** [WHO Antiallergics and Medicine Use in Anaphylaxis](#) **More information in WHO EML 2017 Section Reference:** 3
1. Fluconazole (50 mg cap/tab) and 2. Nystatin (tablet 500 000 IU)	Anti-fungal drugs	**Rationale:** Nystatin is an antifungal polyene antibiotic that is effective against infections caused by a wide range of yeasts and yeasts-like fungi. It is used for the treatment of oral, oesophageal and intestinal candidosis. Fluconazole is an orally active imidazole antifungal agent with activity against dermatophytes, yeasts, and other pathogenic fungi. It is widely used in the treatment of serious gastrointestinal and systemic mycoses as well as in the management of superficial infections. Fluconazole is also used to prevent fungal infections in immunocompromised patients. **Treatment References**: [WHO Model Formulary 2008](#) [WHO Model Prescribing Information](#) [Drugs used in sexually transmitted diseases](#) **More information in WHO EML 2017 Section Reference:** 6.3
Levothyroxine (tablet 50 micrograms)	Thyroid hormones	**Rationale:** Levothyroxine is used for the management of hypothyroidism, diffuse non-toxic goitre, Hashimoto thyroiditis and thyroid cancer. **Treatment References**: [WHO Model Formulary 2008](#) **More information in WHO EML 2017 Section Reference:** 18.8

* These additional medicines were suggested for monitoring during the consultations with WHO regional advisers and WHO Member States, however they do not represent major burden of disease in countries and cannot be weighted according to the same procedure as the mandatory list.

Table 2. Diseases treated with the medicines in the core list

| Medicine name	Affiliated disease (code of the diseases according to the ICD-11 classification)
Salbutamol	→ Asthma (1190) → Chronic obstructive pulmonary disease (1180)
Beclometasone or other corticosteroid inhaler	→ Asthma (1190)
Gliclazide or other sulfonylurea	
Metformin	→ Diabetes mellitus (800)
Insulin regular, soluble	
Amlodipine	→ Hypertensive heart disease (1120)
Enalapril or other angiotensin converting enzyme inhibitor	→ Hypertensive heart disease (1120)
Hydrochlorothiazide or Chlorthalidone	→ Cardiomyopathy, myocarditis, endocarditis (1150)
Bisoprolol or alternative betablocker (atenolol or carvedilol or metoprolol only)	→ Hypertensive heart disease (1120) → Ischaemic heart disease (1130) → Other circulatory diseases (1160) → Cardiomyopathy, myocarditis, endocarditis (1150)
Furosemide	→ Cardiomyopathy, myocarditis, endocarditis (1150)
Simvastatin or other statin	→ Ischaemic heart disease (1130) → Stroke (1140)
Acetylsalicylic acid (aspirin)	→ Ischaemic heart disease (1130)
Morphine	→ Malignant neoplasms (610)
Paracetamol	→ weight = 1/T
Ibuprofen	→ weight = 1/T
Fluoxetine or other selective serotonin reuptake inhibitor	→ Depressive disorders (830)
Phenytoin or Carbamazepine	→ Epilepsy (970)
Gentamicin	→ Lower respiratory infections (390) → Infectious and parasitic diseases (20)
Amoxicillin	
Ceftriaxone	→ Infectious and parasitic diseases (20)
Procaine benzylpenicillin or Benzathine benzylpenicillin	
Ethinylestradiol + levonorgestrel (or alternative combined oral contraceptive)	
Medroxyprogesterone acetate injection	→ Maternal conditions (420)
Progesterone-releasing implant (etonogestrel or levonorgestrel)	
Levonorgestrel	
Oral rehydration	→ Diarrhoeal diseases (110)
Zinc sulphate	
Oxytocin	→ Maternal conditions (420)
Magnesium sulphate	→ Epilepsy (970)
Folic acid	→ Iron-deficiency anaemia (580)
Artemether+lumefantrine	
Artesunate+amodiaquine	
Artesunate+mefloquine	→ Malaria (220)
Dihydroartemisinin+piperaquine	
Artesunate+sulfadoxine-pyrimethamine	
Artesunate	
Efavirenz + Emtricitabine + Tenofovir disoproxil fumarate	→ HIV/AIDS (100)
Efavirenz + Lamivudine + Tenofovir disoproxil fumarate	
Chlorhexidine	→ Neonatal sepsis and infections (520)

Ready-to-use therapeutic food (RUTF)	→ Nutritional deficiencies (540)
Isoniazid + pyrazinamide + rifampicin	→ Tuberculosis (30)
Erythropoiesis - stimulating agents	→ Other chronic kidney disease (1273)
Suggested for monitoring (optional)	
Epinephrine or Dexamethasone	
Fluconazole	→ weight = $0.5*(1/T)$
Nystatin	
Levothyroxine	

Annex 2. Calculation of weights

Weights are region-specific, and the sum of the weights assigned to medicines in the basket is always equal to "1" in a given region. Since some of the medicines are weighted not according to the DALYs but according to the formula in points iii. and iv. above, the weights have to be normalized so that their sum is equal to "1".

WHO regional data on disease burden is computed and published for 5-year intervals (e.g. 2000, 2005, 2010 and 2015 for now). As a result, for data points falling between the reference years for which DALY estimates are available the closest reference year is used to calculate medicines' weights (either previous or following) (*Figure 1*).

Figure 2.1. Selection of data year for computing medicine weights
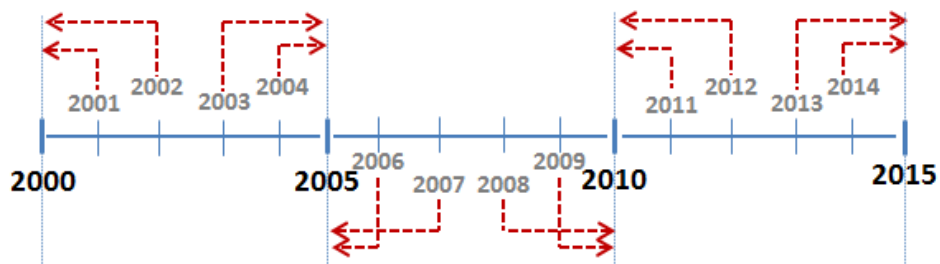
Two versions of weights are computed: one capturing 32 medicines (excluding optional medicines) and the other capturing 36 medicines (including optional medicines). For countries where the distribution of specific medicines is calculated only in specialized facilities (for example injectable medicines are provided only in hospitals), WHO suggests computing two versions of weights (1 – for pharmacies and other non-tertiary health care facilities based on a shorter list of medicines that exclude the mentioned medicines and 2 – for hospitals that includes the full list of medicines).

Table 2.1: Region specific weights applied for medicines in a defied basket [**excluding** suggested for monitoring (optional) medicines]*

N	Medicine name	AFRO	EMRO	EURO	PAHO	SEARO	WPRO
1	Acetylsalicylic acid (aspirin)	0.0084	0.0408	0.1276	0.0796	0.0561	0.0719
2	Amoxicillin	0.1502	0.0581	0.0230	0.0364	0.0988	0.0301
3	Artemether+lumefantrine **OR** Artesunate+amodiaquine **OR** Artesunate+mefloquine **OR** Dihydroartemisinin+piperaquine **OR** Artesunate+sulfadoxine-pyrimethamine	0.0264	0.0013	0.0000	0.0002	0.0021	0.0004
4	Artesunate	0.0264	0.0013	0.0000	0.0002	0.0021	0.0004
5	Beclometasone **OR** other corticosteroid inhaler	0.0041	0.0064	0.0074	0.0122	0.0091	0.0068
6	Bisoprolol **OR** alternative betablocker (atenolol **OR** carvedilol or metoprolol only) **OR** Amlodipine	0.0154	0.0528	0.1683	0.1162	0.0671	0.0968
7	Ceftriaxone	0.1502	0.0581	0.0230	0.0364	0.0988	0.0301
8	Chlorhexidine	0.0002	0.1483	0.0015	0.0001	0.0008	0.0271
9	Efavirenz + Emtricitabine + Tenofovir disoproxil fumarate **OR** Efavirenz + Lamivudine + Tenofovir disoproxil fumarate	0.0340	0.0019	0.0086	0.0105	0.0082	0.0040
10	Erythropoiesis - stimulating agents	0.0008	0.0010	0.0002	0.0002	0.0003	0.0462
11	Ethinylestradiol + levonorgestrel **OR** Levonorgestrel **OR** Medroxyprogesterone acetate **OR** Progesterone-releasing implant **OR** Levonorgestrel	0.0092	0.0041	0.0005	0.0021	0.0041	0.0012
12	Fluoxetine **OR** other selective serotonin reuptake inhibitor	0.0054	0.0101	0.0223	0.0322	0.0145	0.0203
13	Folic acid	0.0086	0.0113	0.0114	0.0183	0.0203	0.0116
14	Furosemide	0.0014	0.0029	0.0137	0.0072	0.0016	0.0029
15	Gentamicin	0.1983	0.0933	0.0414	0.0667	0.1350	0.0509
16	Gliclazide **OR** other sulfonylurea	0.0053	0.0155	0.0223	0.0513	0.0210	0.0241
17	Hydrochlorothiazide or Chlorthalidone **OR** Enalapril or other ACEI	0.0033	0.0060	0.0201	0.0151	0.0078	0.0134
18	Ibuprofen	0.0333	0.0333	0.0333	0.0333	0.0333	0.0333
19	Insulin regular, soluble	0.0053	0.0155	0.0223	0.0513	0.0210	0.0241
20	Isoniazid + pyrazinamide + rifampicin	0.0033	0.0239	0.0003	0.0039	0.0007	0.0515
21	Magnesium sulphate	0.0029	0.0038	0.0039	0.0052	0.0045	0.0032
22	Metformin	0.0053	0.0155	0.0223	0.0513	0.0210	0.0241
23	Morphine	0.0148	0.0311	0.1484	0.1267	0.0458	0.1338
24	Oral rehydration	0.0330	0.0216	0.0023	0.0067	0.0269	0.0038
25	Oxytocin	0.0092	0.0041	0.0005	0.0021	0.0041	0.0012
26	Paracetamol	0.0333	0.0333	0.0333	0.0333	0.0333	0.0333
27	Phenytoin **OR** Carbamazepine	0.0029	0.0038	0.0039	0.0052	0.0045	0.0032
28	Procaine benzylpenicillin **OR** Benzathine benzylpenicillin	0.1502	0.0581	0.0230	0.0364	0.0988	0.0301
29	Ready-to-use therapeutic food (RUTF)	0.0007	0.1455	0.0000	0.0003	0.0009	0.0073
30	Salbutamol	0.0067	0.0142	0.0267	0.0400	0.0384	0.0465
31	Simvastatin **OR** other statin	0.0181	0.0615	0.1863	0.1127	0.0920	0.1624
32	Zinc sulphate	0.0330	0.0216	0.0023	0.0067	0.0269	0.0038

Weights for 32 medicines are computed. Where several medicines or combinations of medicines are specified (listed with "OR"), one medicine has to be selected for the further computation of the SDG indicator.

Lower disease burden & lower medicine weight

Higher disease burden & higher medicine weight

Table 2.2: Region specific weights applied for medicines in a defied basket [**including** suggested for monitoring (optional) medicines]

N	Medicine name	AFRO	EMRO	EURO	PAHO	SEARO	WPRO
1	Acetylsalicylic acid (aspirin)	0.0081	0.0390	0.1219	0.0761	0.0536	0.0687
2	Amoxicillin (for adults)	0.1436	0.0555	0.0220	0.0348	0.0944	0.0287
3	Artemether+lumefantrine **OR** Artesunate+amodiaquine **OR** Artesunate+mefloquine **OR** Dihydroartemisinin+piperaquine **OR** Artesunate+sulfadoxine-pyrimethamine	0.0252	0.0012	0.0000	0.0002	0.0020	0.0004
4	Artesunate	0.0252	0.0012	0.0000	0.0002	0.0020	0.0004
5	Beclometasone **OR** other corticosteroid inhaler	0.0040	0.0061	0.0071	0.0117	0.0087	0.0065
6	Bisoprolol **OR** alternative betablocker (atenolol **OR** carvedilol or metoprolol only) **OR** Amlodipine	0.0148	0.0505	0.1608	0.1110	0.0641	0.0925
7	Ceftriaxone	0.1436	0.0555	0.0220	0.0348	0.0944	0.0287
8	Chlorhexidine	0.0002	0.1417	0.0014	0.0001	0.0007	0.0259
9	Efavirenz + Emtricitabine + Tenofovir disoproxil fumarate **OR** Efavirenz + Lamivudine + Tenofovir disoproxil fumarate	0.0325	0.0018	0.0082	0.0100	0.0078	0.0038
10	Epinephrine or Dexamethasone	0.0135	0.0135	0.0135	0.0135	0.0135	0.0135
11	Erythropoiesis - stimulating agents	0.0008	0.0009	0.0002	0.0002	0.0003	0.0442
12	Ethinylestradiol + levonorgestrel **OR** Levonorgestrel **OR** Medroxyprogesterone acetate **OR** Progesterone-releasing implant **OR** Levonorgestrel	0.0088	0.0039	0.0005	0.0020	0.0039	0.0012
13	Fluconazole	0.0135	0.0135	0.0135	0.0135	0.0135	0.0135
14	Fluoxetine **OR** other selective serotonin reuptake inhibitor	0.0051	0.0096	0.0213	0.0308	0.0138	0.0194
15	Folic acid	0.0082	0.0108	0.0109	0.0175	0.0194	0.0111
16	Furosemide	0.0013	0.0028	0.0131	0.0069	0.0015	0.0028
17	Gentamicin	0.1895	0.0892	0.0396	0.0637	0.1290	0.0487
18	Gliclazide **OR** other sulfonylurea	0.0051	0.0148	0.0213	0.0490	0.0201	0.0231
19	Hydrochlorothiazide or Chlorthalidone **OR** Enalapril or other ACEI	0.0031	0.0057	0.0192	0.0144	0.0074	0.0128
20	Ibuprofen (for adults)	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270
21	Insulin regular, soluble	0.0051	0.0148	0.0213	0.0490	0.0201	0.0231
22	Isoniazid + pyrazinamide + rifampicin	0.0032	0.0229	0.0003	0.0037	0.0007	0.0492
23	Levothyroxine	0.0135	0.0135	0.0135	0.0135	0.0135	0.0135
24	Magnesium sulphate	0.0028	0.0036	0.0037	0.0050	0.0043	0.0030
25	Metformin	0.0051	0.0148	0.0213	0.0490	0.0201	0.0231
26	Morphine	0.0142	0.0297	0.1418	0.1210	0.0437	0.1278
27	Nystatin	0.0135	0.0135	0.0135	0.0135	0.0135	0.0135
28	Oral rehydration	0.0315	0.0206	0.0022	0.0064	0.0257	0.0037
29	Oxytocin	0.0088	0.0039	0.0005	0.0020	0.0039	0.0012
30	Paracetamol	0.0270	0.0270	0.0270	0.0270	0.0270	0.0270
31	Phenytoin **OR** Carbamazepine	0.0028	0.0036	0.0037	0.0050	0.0043	0.0030
32	Procaine benzylpenicillin **OR** Benzathine benzylpenicillin	0.1436	0.0555	0.0220	0.0348	0.0944	0.0287
33	Ready-to-use therapeutic food (RUTF)	0.0006	0.1391	0.0000	0.0003	0.0009	0.0070
34	Salbutamol	0.0064	0.0135	0.0255	0.0382	0.0367	0.0444
35	Simvastatin **OR** other statin	0.0173	0.0588	0.1780	0.1077	0.0879	0.1552
36	Zinc sulphate	0.0315	0.0206	0.0022	0.0064	0.0257	0.0037

*Weights for 36 medicines are computed. Where several medicines or combinations of medicines are specified (listed with "OR"), one medicine has to be selected for the further computation of the SDG indicator.

Annex 3: Basket of core set of relevant essential medicines for primary health care: number of units and duration per treatment

Medicine	Dose	Duration	Units
Salbutamol	100 mcg/dose inhaler	30	30
Beclometasone	100 mcg/dose inhaler	30	60
Gliclazide	80 mg cap/tab	30	30
Metformin	500 mg cap/tab **OR** 850 mg cap/tab OR 1 g cap/tab	30	90
Insulin regular, soluble	100 IU/ml injection	30	90
Amlodipine	5 mg cap/tab	30	30
Enalapril	5 mg cap/tab	30	30
Hydrochlorothiazide	25 mg cap/tab	30	30
Chlorthalidone	25 mg cap/tab	30	15
Bisoprolol	5 mg cap/tab	30	30
Simvastatin	20 mg cap/tab	30	30
Acetylsalicylic acid (aspirin)	100 mg cap/tab	30	30
Morphine	10mg cap/tab	30	180
Paracetamol	500 mg tab/cap	30	180
Fluoxetine	20 mg cap/tab	30	30
Phenytoin	100mg cap/tab	30	90
Carbamazepine	200 mg cap/tab	30	150
Gentamicin	40 mg/mL in 2mL vial	3	15
Amoxicillin for adults	500mg cap/tab	7	21
Ceftriaxone	1g/vial Injection	1	1
Procaine benzylpenicillin	1G = 1MU Injection	10	10
Benzathine benzylpenicillin	900mg=1.2 MIU **OR** 1.44g = 2.4MIU injection	1	1 or 2
Ethinylestradiol + levonorgestrel	30 mcg cap/tab + 150 mcg cap/tab	28	21
Levonorgestrel	30 mcg cap/tab	28	28
Medroxyprogesterone acetate injection	IM 150 mg/mL **OR** SC 104 mg/0.65mL	84	1
Progesterone-releasing implant: Etonogestrel OR Levonorgestrel	Etonogestrel 68 mg OR Levonorgestrel 150 mg	3 or 5 years	1
Levonorgestrel	750 mcg **OR** 1.5 mg tablet	1	2 or 1
Oral rehydration salts	1 litre	1	3
Zinc sulphate	20mg dispersible tablet	14	14
Oxytocin	5iu or 10iu injection	1	1
Magnesium sulphate	50% 10ml Injection	1	2
Folic acid	400 mcg tablet	30	30
Artemether+lumefantrine	20/120 mg cap/tab	3	24
Artesunate+amodiaquine	100 mg + 270 mg	3	6
Artesunate+mefloquine	100 mg + 220 mg	3	6
Dihydroartemisinin+piperaquine	40 mg + 320 mg	3	9
Artesunate+sulfadoxine-pyrimethamine	200 mg + 1500mg + 75mg	3	3 + 1
Artesunate	60 mg injection **OR** 100 mg rectal dose form	1	1
Efavirenz + Emtricitabine + Tenofovir disoproxil fumarate	400 mg OR 600 mg + 200 mg + 300 mg	30	30
Efavirenz + Lamivudine + Tenofovir	400 mg or 600 mg + 300 mg + 300 mg	30	30

disoproxil fumarate			
Ibuprofen for adults	200mg cap/tab	30	60
Furosemide	40 mg cap/tab	30	30
Epinephrine	1 mg injection	1	0.5
Dexamethasone	injection 4 mg/ mL in 1- mL ampoule (as disodium phosphate salt)	1	1
Fluconazole	50 mg cap/tab (depending on indication)		
Nystatin	tablet 500 000 IU	2	8
Levothyroxine	tablet 50 micrograms	30	60
Chlorhexidine	Solution or gel: 7.1% (digluconate) delivering 4% chlorhexidine	7	1
Ready-to-use therapeutic food (RUTF)	paste or spread (1 sachet = 92 g [500 Kcal]) **OR** biscuit (28.4g, 500 kcal per 100g)	30	150 - 220 kcal/kg per day
Isoniazid + pyrazinamide + rifampicin	50 mg + 150 mg + 75 mg	30	30 (60, 90 or 120)
Epoetin alfa	2,000 IU/mL	12	50 units/kg

Annex 4 – Combination of availability and affordability

As an example, consider a simplified case of access to a basket of three medicines (*Figure 2*). In the matrix:

- "1" indicates that a medicine is available or is affordable.
- "0" indicates that a medicine is not available or not affordable. In other words, "0" in the matrix indicates that the dimension is deprived.
- "." indicates cases when medicine is not available and consequently affordability of medicine is not measured. In other words, information on prices cannot be collected when a medicine is not found by the interviewer in the facility.

Figure 4.1. Achievement matrix on access to medicine (two dimensions)

$$X = \begin{pmatrix} 1 & 1 \\ 1 & 0 \\ 0 & . \end{pmatrix} \begin{matrix} \leftarrow \text{medicine 1} \\ \leftarrow \text{medicine 2} \\ \leftarrow \text{medicine 3} \end{matrix}$$

In this basket the 1st medicine is fully accessible (i.e. it is both available and affordable), the 2nd medicine is partially accessible (i.e. it is available but not affordable), while the 3rd medicine is inaccessible (i.e. it is not available and thus it is not possible to collect information on prices).

In this example, the first medicine is accessible and the third medicine is not. However, the second medicine is partially deprived indicating that specific policies applied in the country may be effective for availability of the medicine but not for its affordability. Applying the union identification approach by S. Alkire and G. Robles that treats elements (medicines) in the matrix with partial deprivation as fully deprived, the second medicine is considered not accessible as well (*Figure 3*).

Figure 4.2. Achievement matrix of access to medicine (two dimensions & deprivation of dimensions)

$$X = \begin{pmatrix} 1 & 1 \\ 1 & 0 \\ 0 & . \end{pmatrix} \rightarrow X' = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$$

At the end of this step, the variable "access" to medicines is generated, combining the 2 dimensions of availability and affordability. This variable remains binary in nature with 1 – medicine is accessible (both available and affordable) and 0 – medicine is not accessible (not available or available but not affordable).