Step-by-step guide for measuring social inequalities in health





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Step by step guide for measuring social inequalities in health

© Every Woman Every Child Latin America and Caribbean (EWEC LAC)

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Step-by-step guide

for measuring social inequalities in health

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Preface

In the last 10 to 15 years, the countries of Latin America and the Caribbean (LAC) have made significant achievements in reproductive, maternal, neonatal, child and adolescent health. Even with these advances, inequalities in access and coverage between and within the countries of the region have persisted and in some cases increased. These inequalities are systematically related to social factors including gender, socioeconomic status, ethnicity, income, and education, to name a few.

One of the main challenges to address social inequalities in health is the lack of strategic information and available evidence on the magnitude of the inequalities, either between or within countries. Currently, most LAC countries are not measuring or monitoring social inequalities in health at the national or local levels. Most national programs and interventions do not include indicators in their monitoring and evaluation frameworks (which fosters the reduction of inequalities).

EWEC-LAC has developed a toolkit that includes methodological orientations and tools for the measurement and monitoring of health inequities. It also provides technical support to institutionalize the measurement and monitoring of inequalities in national health information systems.

We are sure that technical staff from Ministries of Health, researchers, students and other global health actors interested in quantitative analysis of social inequalities will find this guide useful. The purpose of this material is to facilitate the measurement and monitoring of social inequalities in health, using a widespread program (Microsoft Excel ®). Assisted by examples, the reader will be able to calculate the simple measures (absolute and relative inequality gaps) and the complex ones (slope index of inequality and concentration index of health), if data disaggregated at the sub-national level is available.

A) Preliminary data preparation

The quality of the outcome analysis will result from data quality at the beginning. It is important to create a sound database including the three dimensions required for inequality analyses:

- 1. Health and morbimortality indicators: outcome variables
- 2. Equity stratifiers: socio-economic variables used to rank the population and define the groups whose health status is to be compared
- 3. Demographic variables: (usually the denominators of the health indicators) needed to calculate the weighting terms according to the population relative size

Some examples:

- 1. Health / morbimortality indicator: Maternal mortality ratio
- 2. Equity stratifier: mean years of schooling
- 3. Demographic variable: live births
- 1. Health / morbimortality indicator: Coverage of family planning modern methods
- 2. Equity stratifier: % of poor households
- 3. Demographic variable: women in reproductive age

The database should have separate spreadsheets for each dimension, and if needed, paired columns for data on two periods of time. A template of database for Excel is available at:

https://www.everywomaneverychild-lac.org/plantilla_de_datos/_____

Once the database is configured, descriptive statistics should be of help to "clean" it from potential mistakes and outliers, and to become acquainted with the data as well. For example, using the interquartile range, the standard deviation or a whiskers and box plot, it is possible to discover which health indicators hold low variability and will, therefore, be of little help to describe social inequalities. The variation coefficient (=standard deviation/ mean x 100) may be used to compare the variability of indicators, even if their units of measure are different.

It is important to identify which equity stratifiers are of nominal (those that do not follow an inherently ordered scale: sex, urban/rural location, ethnicity) or ordinal nature (those that follow a logically ordered scale: income, levels of education achieved, access to water and sanitation). The simple inequality measures allow both types of stratifiers, not the complex ones, restricted to ordinal equity stratifiers.

| Type of stratifier | Example | Measures allowed |
|--------------------|----------------------------|---|
| NOMINAL | Urban vs. rural population | Absolute gap Relative gap |
| ORDINAL | % of analphabet population | Absolute gap Relative gap Slope index of inequality Health concentration index |

Before starting to practice, it is recommended to extract from the database like the one shown below, to follow the next steps easily.

| | А | В | С | D |
|----|--|------------------|-------------------|-----------------------|
| 1 | | Health indicator | Health stratifier | Demographic weigthing |
| 2 | Demographic units (departments, provinces, minicipalities) | Year 1 | Year 2 | Year 3 |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |

Once the data is arranged in the excel sheet, the procedure can be followed more easily.

B) Absolute and relative gaps of inequality with grouped data

a. Absolute and relative gaps of inequality with grouped data

Step Sort the data panel according to the equity stratifier (for ordinal stratifiers)

Whenever an ordinal equity stratifier is used, data should be ordered according to the stratifier's values. It is recommended to start top-bottom from the worst-off social situation to the best-off social situation. In some cases, like GDP per capita, the geographical units (also called observation units) with the highest values of the stratifier will lay on the bottom; on the opposite, geographical units with the highest value of the stratifier, like percentage of poor households, will be on top. The examples of the rest of the guide use ordinal stratifiers.

For nominal stratifiers, it is recommended that the selected reference group be placed at the bottom for convenience. Comparisons among the different subgroups formed by a nominal stratifier (i.e. ethnic groups) may be made as necessary.

(Next page)

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| | | I Format * as Table | | | ٥ | ive bir | 2006 | 3,587 | 3,712 | 9,042 | 7,624 | 4,335 | 3,733 | 960'6 | 7,007 | 3,055 | 30,81 | 6,077 | 14,92 | 5,180 | 4,681 | 2,356 | 3,156 | | | | |
| | Na Na | Condition | | | | | | | | | | | | | | | | | | | | | | | | | |
| | • | 00. 00. 00. | 12 | | | c | | | | | | | | | | | | | | | | | | | | | |
| | a | • % | Number | | | lletera | | | | | | | | | | | | | | | | | | | | | |
| | Gener | \$9 } | Ø | | c | omen i | 2006 | 32.1 | 17.4 | 17.4 | 29.1 | 17.3 | 16.8 | 34.4 | 16.9 | 26.6 | 11.1 | 18.2 | 30.5 | 27.2 | 32.4 | 32.2 | 16 | | | | |
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| | | | | | | | |
| | | | | | _ | | |
| | | | | | | OK | Cancel |

| | А | В | С | D |
|----|-----------|--------------------------|--------------------------------|-------------|
| 1 | | | | |
| 2 | | Maternal mortality ratio | Percentage of women illeteracy | Live births |
| 3 | Districts | 2006 | 2006 | 2006 |
| 4 | G | 133.07 | 34.4 | 9,096 |
| 5 | N | 243.09 | 32.4 | 4,681 |
| 6 | 0 | 184.76 | 32.2 | 2,356 |
| 7 | Α | 137.1 | 32.1 | 3,587 |
| 8 | L | 106.4 | 30.5 | 14,926 |
| 9 | D | 100.8 | 29.1 | 7,624 |
| 10 | Μ | 57.3 | 27.2 | 5,180 |
| 11 | 1 | 63.1 | 26.6 | 3,059 |
| 12 | К | 31.3 | 18.2 | 6,077 |
| 13 | В | 0 | 17.4 | 3,712 |
| 14 | С | 55.3 | 17.4 | 9,042 |
| 15 | E | 0 | 17.3 | 4,335 |
| 16 | Н | 43 | 16.9 | 7,007 |
| 17 | F | 80.19 | 16.8 | 3,733 |
| 18 | Р | 125.31 | 16 | 3,156 |

12

Group data using quantiles of the social stratifier

Step

2

Depending on the number of geographical units and the heterogeneity of the equity stratifier, population groups generically named quantiles can be formed. Three groups would be "terciles," four, "quartiles"; five, "quintiles"; ten, "deciles" and so on.

This example uses quintiles, which means that the distribution of the stratifier finds cut points at percentiles 20, 40, 60 and 80, denoted by P.20, P.40, P.60, P.80.

Groups (quintiles in this example) are formed as follows:

- If the stratifier is bottom-top sorted
 - o Group 1 (socially worst-off): units with values of the stratifier less or equal to P.20
 - o Group 2: units with values of the stratifier higher than P.20, but less or equal to P.40
 - o Group 3: units with values of the stratifier higher than P.40, but less or equal to P.60
 - o Group 4: units with values of the stratifier higher than P.60, but less or equal to P.80
 - o Group 5 (socially best-off): units with values of the stratifier higher than P.80
- If the stratifier is top-bottom sorted:
 - o Group 1 (socially worst-off): units with values of the stratifier higher than P.80
 - o Group 2: units with values of the stratifier higher than P.60, but less or equal to P.80
 - o Group 3: units with values of the stratifier higher than P.40, but less or equal to P.60
 - o Group 4: units with values of the stratifier higher than P.20, but less or equal to P.40
 - o Group 5 (socially best-off): units with values of the stratifier less or equal to P.20

(Next page)

| G4 ← Jx =PE | | | | | | |
|-------------|-----------------------|--------------------------------|-------------|------------------|----------------|---------------|
| А | | | | | | |
| | В | С | D | Е | щ | ŋ |
| Mate | ernal mortality ratio | Percentage of women illeteracy | Live births | | | |
| Districts | 2006 | 2006 | 2006 | Quintile (group) | Percentile (x) | Cut-off point |
| | 133.07 | 34.4 | 9006 | 1 | 1 | 1 |
| | 243.09 | 32.4 | 4681 | 2 | 0.8 | 32.1 |
| | 184.76 | 32.2 | 2356 | m | 0.6 | 27.2 |
| | 137.1 | 32.1 | 3587 | 4 | 0.4 | 17.4 |
| | 106.4 | 30.5 | 14926 | S | 0.2 | 16.9 |
| | 100.8 | 29.1 | 7624 | | | |
| | 57.3 | 27.2 | 5180 | | | |
| | 63.1 | 26.6 | 3059 | | | |
| | 31.3 | 18.2 | 6077 | | | |
| | 0 | 17.4 | 3712 | | | |
| | 55.3 | 17.4 | 9042 | | | |
| | 0 | 17.3 | 4335 | | | |
| | 43 | 16.9 | 7007 | | | |
| | 80.19 | 16.8 | 3733 | | | |
| | 125.31 | 16 | 3156 | | | |
| | 23.1 | 11.1 | 30812 | | | |

Note. In the case of counting with less than ten geographical units, it is advisable not to group data and effect pairwise comparisons among the socially worst and best-off units

Step-by-step guide | Gradient-based measures of social inequality in health.

Step 2

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Step 3 🕨

Calculate the population of each group

Example:

| Е | opulation of each group | | | | 16133 | 3 | | 26137 | | | 14316 | | | 17089 | | | | 44708 | |
|---------------|--------------------------------|-------------|--------|--------|--------|-------|--------|-------|------|------|-------|------|------|-------|------|-------|--------|-------|--|
| D | Live births | 2006 | 9006 | 4681 | 2356 🔮 | 3587 | 14926 | 7624 | 5180 | 3059 | 6077 | 3712 | 9042 | 4335 | 7007 | 3733 | 3156 | 30812 | |
| C | Percentage of women illeteracy | 2006 | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 | |
| B Formula Bar | Maternal mortality ratio | 2006 | 133.07 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0 | 55.3 | 0 | 43 | 80.19 | 125.31 | 23.1 | |
| A | 2 | 3 Districts | 4 G | 5 N | 6 0 | 7 A | 8 8 | 0 D | 10 M | 11 | 12 K | 13 B | 14 C | 15 E | 16 H | 17 F | 18 P | 19 J | |

=SUM(range of the population data)

Excel syntax

15

Step 4 🕨

Calculate the population weight of each geographical unit within each group

Example:

| ц | Weight of each district within its group | | 0.563813302 | 0.290150623 | 0.146036075 | 0.137238398 | 0.571067835 | 0.291693767 | 0.361832914 | 0.213677005 | 0.424490081 | 0.217215753 | 0.529112294 | 0.253671953 | 0.156728102 | 0.083497361 | 0.070591393 | 0.689183144 | |
|---|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----|
| Э | Population of each group | | | | 16133 | | | 26137 | | | 14316 | | | 17089 | | | | 44708 | |
| D | Live births | 2006 | 9606 | 4681 | 2356 | 3587 | 14926 | 7624 | 5180 | 3059 | 6077 | 3712 | 9042 | 4335 | 7007 | 3733 | 3156 | 30812 | |
| С | Percentage of women illeteracy | 2006 | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 | |
| B | Maternal mortality ratio | 2006 | 133.07 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0 | 55.3 | 0 | 43 | 80.19 | 125.31 | 23.1 | |
| A | 2 | 3 Districts | 4 G | N | 6 0 | 7 A | 8 L | 9 D | 10 M | 11 | 12 K | 13 B | 14 C | 15 E | 16 H | 17 F | 18 P | 19 J | 20 |

=Population of each unit / population of the whole group

Excel syntax

Step 5 🕨

Calculate the component of the weighted average of the health indicator for each geographical unit (observa-tion unit)

Example:

| | AB | С | D | Е | F | Ð |
|-------|--------------------------|--------------------------------|-------------|--------------------------|------------------------------------|---|
| | | | | | Weight of each district within its | Component of the weighted average of |
| č | Maternal mortality ratio | Percentage of women illeteracy | Live births | Population of each group | group | MMR |
| Sin U | 133.07 | 34.4 | 9096 | | 0.564 | =F4*B4 |
| z | 243.09 | 32.4 | 4681 | | 0.290 | 70.5 |
| 0 | 184.76 | 32.2 | 2356 | 16133 | 0.146 | 26.9 |
| ٨ | 137.1 | 32.1 | 3587 | | 0.137 | 18.8 |
| _ | 106.4 | 30.5 | 14926 | | 0.571 | 60.7 |
| ٥ | 100.8 | 29.1 | 7624 | 26137 | 0.292 | 29.4 |
| Σ | 57.3 | 27.2 | 5180 | | 0.362 | 20.7 |
| _ | 63.1 | 26.6 | 3059 | | 0.214 | 13.4 |
| ¥ | 31.3 | 18.2 | 6077 | 14316 | 0.424 | 13.2 |
| 8 | 0 | 17.4 | 3712 | | 0.217 | 0.0 |
| U | 55.3 | 17.4 | 9042 | | 0.529 | 29.2 |
| ш | 0 | 17.3 | 4335 | 17089 | 0.254 | 0.0 |
| Т | 43 | 16.9 | 7007 | | 0.157 | 6.7 |
| ш | 80.19 | 16.8 | 3733 | | 0.083 | 9.9 |
| ۵ | 125.31 | 16 | 3156 | | 0.071 | 8.8 |
| _ | 23.1 | 11.1 | 30812 | 44708 | 0.689 | 15.9 |



Excel syntax

18

Calculate the weighted average of the health indicator for each group

Example:

| AMaterial motality ratioMeric from the fraction of each f | т | RMM weighted average | | | =SUM(G4:G6) | | 108.980 | | | 47.503 | | | 29.260 | | | FOL BL | 38.201 | |
|--|-----|--|--------------|--------|-------------|--------|---------|--------|--------|--------|--------|-------|--------|-------|-------|--------|--------|--------|
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | U | Component of the weighted average of MMR | 75.027 | 70.533 | 26.982 | 18.815 | 60.762 | 29.403 | 20.733 | 13.483 | 13.287 | 0.000 | 29.260 | 0.000 | 6.739 | 6.696 | 8.846 | 15.920 |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | LL. | Weight of each district within its group | 0.564 | 0.290 | 0.146 | 0.137 | 0.571 | 0.292 | 0.362 | 0.214 | 0.424 | 0.217 | 0.529 | 0.254 | 0.157 | 0.083 | 0.071 | 0.689 |
| A Matemal mortality ratio Percentage of women lifeteracy Live births Districts 2006 2006 2006 2006 13307 3300 344 9056 2006 13307 344 9056 2006 13307 324 446 9056 1371 321 324 4661 1371 321 321 355 1371 321 324 4661 1371 321 321 355 1371 321 321 355 1371 321 324 466 1064 313 317 4356 1063 313 312 14926 313 132 312 14926 313 132 132 14936 313 132 132 14936 313 132 132 14936 313 132 132 14335 3146 168 <th>ш</th> <th>Population of each group</th> <td></td> <td></td> <td>16133</td> <td></td> <td></td> <td>26137</td> <td></td> <td></td> <td>14316</td> <td></td> <td></td> <td>17089</td> <td></td> <td></td> <td></td> <td>44708</td> | ш | Population of each group | | | 16133 | | | 26137 | | | 14316 | | | 17089 | | | | 44708 |
| A B B Comparison Compar | D | Live births | 9096 | 4681 | 2356 | 3587 | 14926 | 7624 | 5180 | 3059 | 6077 | 3712 | 9042 | 4335 | 7007 | 3733 | 3156 | 30812 |
| A B Alaternal mortality ratio Districts Maternal mortality ratio 2006 133.07 233.09 137.1 137.1 137.1 137.1 137.1 136.4 137.1 106.4 137.1 106.4 137.1 106.4 137.1 106.4 137.1 106.4 137.1 106.4 137.1 106.4 137.1 106.8 57.3 63.1 63.1 21.3 137.1 106.8 106.8 106.8 106.8 1000 | J | Percentage of women illeteracy | 2005 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 |
| Districts | æ | Maternal mortality ratio | 133.07 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0 | 55.3 | 0 | 43 | 80.19 | 125.31 | 23.1 |
| 0 8 4 9 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | A | Z | | Z | 0 | 7 A | 8 | 9 D | M O | 1 - | 2 K | 3 B | 4 C | 5 E | (6 H | 2 F | 80 P | [6] |



Excel syntax

+ (= X ✓ ∱ =SUM(G4:G6)

SUM

StepCalculate and interpret the absolute gap comparing group 1 and group 57Example:

| Groups | Weighted average of each group | Absolute gap (G1-G5) |
|--------|--------------------------------|-------------------------|
| G1 | 172.5 | |
| G2 | 109.0 | |
| G3 | 47.5 | 172.5-38.2 = 134.3 |
| G4 | 29.3 | |
| G5 | 38.2 | |

Interpretation: For the data in the example, for that country in that year, there were 134.3 more maternal deaths per 100,000 live births in the group with the lowest educational status, compared to the group with the highest educational status. In other words, the absolute gap expresses the magnitude difference of mortality experience between the worst-off and best-off educational status.

Step 8

Calculate and interpret the relative gap comparing group 1 and group 5

Example:

| Groups | Weighted average of each group | Absolute gap (G1/G5) |
|--------|--------------------------------|-------------------------|
| G1 | 172.5 | |
| G2 | 109.0 | |
| G3 | 47.5 | 172.5/38.2 = 4.5 |
| G4 | 29.3 | |
| G5 | 38.2 | |

Interpretation: For the data in the example, for that country in that year, maternal mortality ratio in the group with the lowest educational status was 4.5 times that of the group with the highest educational group. In other words, the mortality experience of the socially most disadvantaged group was more than four times that of the least socially disadvantaged group.

Step
9Using data available on two periods of time: four scenarios of
performance

When data two periods of time are available, once the calculation of inequality gaps for each period is done as well as having the national-level figure of the health indicator, it is recommended to compare those findings with the following four scenarios. The four scenarios analysis elaborates on the performance of the country regarding not only the health indicator by itself but in parallel to the inequality gaps.

CHANGE OF THE INEQUALITY MEASURE

| | _ | NARROWING | WIDENING |
|--|-----------|--|---|
| POPULATION- WIDE CHANGE IN THE HEALTH/ | IMPROVING | The best result | Improvement with inequality: health indicator improved among the most privileged, not necessarily among the most socially deprived |
| INDICATOR | WORSENING | Worsening with protection: health advances in the socially deprived helped reduce the inequality gap, but the overall health indicator worsened in the period | The worst result |

Step-by-step guide | Gradient-based measures of social inequality in health.

C) Gradient measures of social inequality in health

a. Slope index of inequality for non-grouped data

For this regression-based measure, it is recommended to leave the data nongrouped to gain statistical power, especially when the geospatial units are a few.



(Next page)

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|---|
| 2 |
| Ð |
| - |
| S |

Example:

| degraphic but but but but butHealth indicator but but but but but butHealth indicator but <b< th=""><th></th><th>A</th><th>B</th><th>С</th><th>D</th><th>ш</th><th>ш</th><th>ŋ</th><th>н</th></b<> | | A | B | С | D | ш | ш | ŋ | н |
|--|--------------|----------------------|--------------------------------|-------------|------------------|--------------------|------------------------------------|-----------|------------|
| | . | Geographical unit | Health indicator | Population | Equity stratifer | Relative frequency | Cumulative frequency (cwPob) | RIDIT (X) | Weight (W) |
| | 2 | District | Maternal mortality ratio (MMR) | Live births | Women illiteracy | | | | |
| | 3 A | | 137.1 | 3,587 | 32.1 | | | | |
| | 4 B | | 0.0 | 3,712 | 17.4 | | | | |
| | 2 | | 55.3 | 9,042 | 17.4 | | | | |
| | 9 | - | 100.8 | 7,624 | 29.1 | | | | |
| | 7 E | | 0.0 | 4,335 | 17.3 | | | | |
| | 8 | | 80.2 | 3,733 | 16.8 | | | | |
| | 6 | (5) | 133.1 | 960'6 | 34.4 | | | | |
| | 10 H | _ | 43.0 | 7,007 | 16.9 | | | | |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | 11 | | 63.1 | 3,059 | 26.6 | | | | |
| | 12 J | | 23.1 | 30,812 | 11.1 | | | | |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | 13 K | | 31.3 | 6,077 | 18.2 | | | | |
| 15 M 57.3 5,180 27.2 16 N 243.09 4,681 32.4 16 N 243.09 4,661 32.4 17 O 184.76 2,356 32.2 18 P 123.1 3,156 16 | 14 L | | 106.4 | 14,926 | 30.5 | | | | |
| | 15 N | V | 57.3 | 5,180 | 27.2 | | | | |
| 17 0 18.76 2,356 32.2 0 18 P 125.31 3,156 16 2 19 Total =SUM(C3:C18) 16 2 2 | 16 N | - | 243.09 | 4,681 | 32.4 | | | | |
| 18 P 125.31 3,156 16 19 Total =SUM(C3:C18) | 17 0 | • | 184.76 | 2,356 | 32.2 | | | | |
| 19 Total =SUM(C3:C18) | 18 P | | 125.31 | 3,156 | 16 | | | | |
| | 19 T | otal | | SUM(C3:C18) | | | | | |

Sorting based on the equity stratifier

Select the range of data to be sorted. Go to Data menu Sort, and select to sort by the stratifier column. Choose the sorting criterion to have the geographical units with the socioeconomically worst-off on top of the list.

| Copy * | anon 'II 'A A = = = = = = = = = = = = = = = = = | ◆・ 書 録 Merge & Center ▼ Alignment | General Entropy No \$ ~ \% \$ - __000 \$ Conditional Formatting as Table * Image: Conditional Formatting * Image: Conditional Formatting * | mal Bad eck Cell Explanatory Sty | Good N Input Lii | eutral L | alculation | Insert Delete Format Cells | 🖉 Fill - | Sort Frite diting |
|----------------------|---|---|---|--|------------------------------------|-----------|------------|-------------------------------|----------|-------------------------|
| A3 • | 6 f. A | | | | | | | | | |
| A | 8 | J | D | ш | LL. | 9 | т | _ | _ | × |
| Geographical unit | Health indicator | Population | Equity stratifer | Relative frequency | Cumulative frequency (cwPob) | RIDIT (X) | Weight (W) | | | |
| District | Maternal mortality ratio (MMR) | Live births | Women illiteracy | | | | | | | |
| | 137.1 | 3,587 | 32.1 | | | | | | | |
| | 0.0 | 3,712 | 17.4 | | | | | | | |
| | 55.3 | 9,042 | 17.4 | | | | | | | |
| | 100.8 | 7,624 | 29.1 | Sort | | | | 80 | | |
| | 0.0 | 4,335 | 17.3 | 031≜dd Level | X Delete Level | apy Level | P Options | My data has header | 2 | |
| | 80.2 | 3,733 | 16.8 | Colum | Sorti | | Order | | | |
| | 133.1 | 960'6 | 34.4 | Sort by Column | D Value | . , | Iaroest to | Smallest | | |
| | 43.0 | 7,007 | 16.9 | | | | | | 1 | |
| | 63.1 | 3,059 | 26.6 | | | | | | | |
| | 23.1 | 30,812 | 11.1 | | | | | | | |
| | 31.3 | 6,077 | 18.2 | | | | | | | |
| | 106.4 | 14,926 | 30.5 | | | | | | | |
| | 57.3 | 5,180 | 27.2 | | | | l | | | |
| | 243.09 | 4,681 | 32.4 | | | | | OK Cancel | | |
| | 184.76 | 2,356 | 32.2 | | | | | | | |
| | 125.31 | 3,156 | 16 | | | | | | | |
| | | 110 202 | | | | | | | | |

Calculation of relative and cumulative frequency

Relative frequency: add up the population of all the geographical units (store in a cell at the bottom) and then divide this by the population of each unit (in the relative frequency cell). You may "fix" the cell of the population total using the "\$" sign as in the example.

| | - | U | Q | | u | U | Ŧ | _ | - |
|----------------------|--------------------------------|-------------|------------------|-----------------------|---------------------------------|-----------|------------|-----|-----|
| seographical unit | Health indicator | Population | Equity stratifer | Relative frequency | Cumulative frequency (cwPob) | RIDIT (X) | weight (w) | M*X | M*Y |
| District | Maternal mortality ratio (MMR) | Live births | Women illiteracy | | | | | | |
| | 133.1 | 960'6 | 34.4 | =C3/C\$19 | 0.077 | | | | |
| | 243.09 | 4,681 | 32.4 | 0.040 | 0.116 | | | | |
| | 184.76 | 2,356 | 32.2 | 0.020 | 0.136 | | | | |
| | 137.1 | 3,587 | 32.1 | 0:030 | 0.167 | | | | |
| | 106.4 | 14,926 | 30.5 | 0.126 | 0.293 | | | | |
| | 100.8 | 7,624 | 29.1 | 0.064 | 0.357 | | | | |
| | 57.3 | 5,180 | 27.2 | 0.044 | 0.401 | | | | |
| | 63.1 | 3,059 | 26.6 | 0.026 | 0.427 | | | | |
| | 31.3 | 6,077 | 18.2 | 0.051 | 0.478 | | | | |
| | 0.0 | 3,712 | 17.4 | 0.031 | 0.509 | | | | |
| | 55.3 | 9,042 | 17.4 | 0.076 | 0.586 | | | | |
| | 0.0 | 4,335 | 17.3 | 0.037 | 0.622 | | | | |
| | 43.0 | 7,007 | 16.9 | 0.059 | 0.682 | | | | |
| | 80.2 | 3,733 | 16.8 | 0.032 | 0.713 | | | | |
| | 125.31 | 3,156 | 16 | 0.027 | 0.740 | | | | |
| | 23.1 | 30,812 | 1.11 | 0.260 | 1.000 | | | | |
| ta | | 118,383 | | 1.000 | | | | | |

26

Calculation of relative and cumulative frequency

frequencies of each unit. The cumulative frequency of the first unit will be its relative frequency. For the second unit, it will be cumulative of the first plus the relative of the second. For the third, the cumulative frequency will be cumulative of the second plus the relative of the third, and so on. Once entering the syntax in the second row (as in the example), you may copy top Cumulative frequency = cwpob (short name for relative cumulative frequency): make a consecutive sum of the relative down to the rest. As a way of testing, the value of the last unit will always have to equal one (1.0).

| SUM | ◆ (* × く ∱ =E4+F3) | - | | _ | | | | | |
|------------------|--------------------------------|-------------|------------------|-----------------------|---------------------------------|-----------|------------|-----|-----|
| A | B | U | D | ш | L | 9 | Ξ | - | - |
| raphical Init | Health indicator | Population | Equity stratifer | Relative frequency | Cumulative frequency (cwPob) | RIDIT (X) | Weight (W) | M*X | M∗γ |
| strict | Maternal mortality ratio (MMR) | Live births | Women illiteracy | | | | | | |
| | 133.1 | 960'6 | 34.4 | 0.077 | 0.077 | | | | |
| | 243.09 | 4,681 | 32.4 | 0.040 | =E4+F3 | | | | |
| | 184.76 | 2,356 | 32.2 | 0.020 | 0.136 | | | | |
| | 137.1 | 3,587 | 32.1 | 0:030 | 0.167 | | | | |
| | 106.4 | 14,926 | 30.5 | 0.126 | 0.293 | | | | |
| | 100.8 | 7,624 | 29.1 | 0.064 | 0.357 | | | | |
| | 57.3 | 5,180 | 27.2 | 0.044 | 0.401 | | | | |
| | 63.1 | 3,059 | 26.6 | 0.026 | 0.427 | | | | |
| | 31.3 | 6,077 | 18.2 | 0.051 | 0.478 | | | | |
| | 0.0 | 3,712 | 17.4 | 0.031 | 0.509 | | | | |
| | 55.3 | 9,042 | 17.4 | 0.076 | 0.586 | | | | |
| | 0.0 | 4,335 | 17.3 | 0.037 | 0.622 | | | | |
| | 43.0 | 7,007 | 16.9 | 0.059 | 0.682 | | | | |
| | 80.2 | 3,733 | 16.8 | 0.032 | 0.713 | | | | |
| | 125.31 | 3,156 | 16 | 0.027 | 0.740 | | | | |
| | 23.1 | 30,812 | 11.1 | 0.260 | 1.000 | | | | |
| | | 118,383 | | 1.000 | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

3 1 1

Calculation of the RIDIT (cumulative frequency in the center of the distribution corresponding to each geographical unit)

RIDIT is half of the sum of two consecutive cumulative frequencies. For the first unit, the RIDIT will be half of its cumulative frequency, considering that there is no previous frequency to sum. For the second unit, the RIDIT will be the sum of the cumulative frequency of the first plus the cumulative frequency of the second, divided by two.

| 8 | | C | D | ш | u. | U | т | _ | - |
|--------------------------|---------|-------------|------------------|-----------------------|---------------------------------|------------|------------|-----|-----|
| Health indicator | | Population | Equity stratifer | Relative frequency | Cumulative frequency (cwPob) | RIDIT (X) | weight (w) | M*X | ₩*Y |
| Maternal mortality ratio | o (MMR) | Live births | Women illiteracy | | | | | | |
| | 133.1 | 960'6 | 34.4 | 0.077 | 0.077 | 0.038 | | | |
| | 243.09 | 4,681 | 32.4 | 0.040 | 0.116 | =(F3+F4)/2 | | | |
| | 184.76 | 2,356 | 32.2 | 0.020 | 0.136 | 0.126 | | | |
| | 137.1 | 3,587 | 32.1 | 0.030 | 0.167 | 0.151 | | | |
| | 106.4 | 14,926 | 30.5 | 0.126 | 0.293 | 0.230 | | | |
| | 100.8 | 7,624 | 29.1 | 0.064 | 0.357 | 0.325 | | | |
| | 57.3 | 5,180 | 27.2 | 0.044 | 0.401 | 0.379 | | | |
| | 63.1 | 3,059 | 26.6 | 0.026 | 0.427 | 0.414 | | | |
| | 31.3 | 6,077 | 18.2 | 0.051 | 0.478 | 0.452 | | | |
| | 0.0 | 3,712 | 17.4 | 0.031 | 0.509 | 0.494 | | | |
| | 55.3 | 9,042 | 17.4 | 0.076 | 0.586 | 0.548 | | | |
| | 0.0 | 4,335 | 17.3 | 0.037 | 0.622 | 0.604 | | | |
| | 43.0 | 7,007 | 16.9 | 0.059 | 0.682 | 0.652 | | | |
| | 80.2 | 3,733 | 16.8 | 0.032 | 0.713 | 0.697 | | | |
| | 125.31 | 3,156 | 16 | 0.027 | 0.740 | 0.726 | | | |
| | 23.1 | 30,812 | 1.11 | 0.260 | 1.000 | 0.870 | | | |
| | | 118,383 | | 1.000 | | | | | |
| | | | | | | | | | |

27

Calculation of the population weight and apply it to both, health indicator and RIDIT

The weight of each unit equals the square-root of its population. In Excel, you may use the syntax "SQRT" as seen in the example.

| | _ | | | _ | _ | _ | - | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ |
|---|---|---------------------------------|--------------------------------|--------|---------|--------|--------|---------|--------|--------|--------|--------|-------|--------|-------|--------|--------|--------|--------|---------|----|
| | - | W*Y | | =H3*B3 | 16631.7 | 8968.0 | 8211.1 | 12999.1 | 8801.4 | 4124.0 | 3489.9 | 2440.0 | 0.0 | 5258.4 | 0.0 | 3599.4 | 4899.5 | 7039.7 | 4054.8 | | |
| | - | W*X | | 0.0 | 6.6 | 6.1 | 9.1 | 28.1 | 28.4 | 27.3 | 22.9 | 35.3 | 30.1 | 52.1 | 39.8 | 54.6 | 42.6 | 40.8 | 152.7 | | |
| | н | weight (w) | | 95.4 | 68.4 | 48.5 | 59.9 | 122.2 | 87.3 | 72.0 | 55.3 | 78.0 | 6.09 | 95.1 | 65.8 | 83.7 | 61.1 | 56.2 | 175.5 | | |
| | 9 | RIDIT (X) | | 0.0 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.6 | 0.7 | 0.7 | 0.7 | 0.9 | | |
| | L | Cumulative frequency (cwPob) | | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 1.0 | | |
| | ш | Relative frequency | | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.3 | 1.000 | |
| | D | Equity stratifer | Women illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 | | |
| | C | Population | Live births | 9,096 | 4,681 | 2,356 | 3,587 | 14,926 | 7,624 | 5,180 | 3,059 | 6,077 | 3,712 | 9,042 | 4,335 | 7,007 | 3,733 | 3,156 | 30,812 | 118,383 | |
| | B | Health indicator | Maternal mortality ratio (MMR) | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | | |
| | A | Geographical unit | District | U | z | 0 | A | | ٩ | Σ | - | × | | U | ш | H | L | P | - | Total | |
| 1 | | - | 2 | m | 4 | S | 9 | 7 | 00 | σ | 10 | 1 | 12 | 10 | 14 | 15 | 16 | E | 18 | 15 | 20 |

Afterward, two columns should be added:

- X*W: will store the product of the population weight and the RIDIT, namely the weighted values of the RIDIT (X). For the regression model in Excel, this is X2, the independent variable of interest.
 - Y*W: will store the product of the population weight and the health indicator, namely the weighted values of the health indicator (Y). For the regression model in Excel, this is Y, the dependent variable of interest.

Note: weights must be inputted this way because Excel lacks weighted minimum square estimation for regression analyses. The model adjusted is:

$YW = \beta_o (0) + \beta_1 (W) + \beta_2 (WX)$

Regarding Excel: "W" of the model is X1, and "WX" of the model is X2. That is why the slope coefficient of interest in the next step will be that of X2

| S |
|---|
| e |
| Š |

| | 8 | U | Q | ш | u. | U | H | _ | - |
|-----------------------|--------------------------------|-------------|------------------|-----------------------|---------------------------------|-----------|------------|--------|---------|
| Geographica 1 unit | Health indicator | Population | Equity stratifer | Relative frequency | Cumulative frequency (cwPob) | RIDIT (X) | Weight (W) | W*X | ₩*Y |
| 2 District | Maternal mortality ratio (MMR) | Live births | Women illiteracy | | | | | | |
| 5 m | 133.1 | 9,096 | 34.4 | 0.1 | 0.1 | 0.0 | 95.4 | =H3*G3 | 12691.3 |
| 4 N | 243.09 | 4,681 | 32.4 | 0.0 | 0.1 | 0.1 | 68.4 | 6.6 | 16631.7 |
| 5 0 | 184.76 | 2,356 | 32.2 | 0.0 | 0.1 | 0.1 | 48.5 | 6.1 | 8968.0 |
| 6 A | 137.1 | 3,587 | 32.1 | 0.0 | 0.2 | 0.2 | 59.9 | 9.1 | 8211.1 |
| 7 L | 106.4 | 14,926 | 30.5 | 0.1 | 0.3 | 0.2 | 122.2 | 28.1 | 12999.1 |
| 80 D | 100.8 | 7,624 | 29.1 | 0.1 | 0.4 | 0.3 | 87.3 | 28.4 | 8801.4 |
| 9 M | 57.3 | 5,180 | 27.2 | 0.0 | 0.4 | 0.4 | 72.0 | 27.3 | 4124.0 |
| 10 | 63.1 | 3,059 | 26.6 | 0.0 | 0.4 | 0.4 | 55.3 | 22.9 | 3489.9 |
| 11 K | 31.3 | 6,077 | 18.2 | 0.1 | 0.5 | 0.5 | 78.0 | 35.3 | 2440.0 |
| 12 B | 0.0 | 3,712 | 17.4 | 0.0 | 0.5 | 0.5 | 6.09 | 30.1 | 0.0 |
| 13 C | 55.3 | 9,042 | 17.4 | 0.1 | 0.6 | 0.5 | 95.1 | 52.1 | 5258.4 |
| 14 E | 0.0 | 4,335 | 17.3 | 0.0 | 0.6 | 0.6 | 65.8 | 39.8 | 0.0 |
| 15 H | 43.0 | 7,007 | 16.9 | 0.1 | 0.7 | 0.7 | 83.7 | 54.6 | 3599.4 |
| 16 F | 80.2 | 3,733 | 16.8 | 0.0 | 0.7 | 0.7 | 61.1 | 42.6 | 4899.5 |
| 17 P | 125.31 | 3,156 | 16 | 0.0 | 0.7 | 0.7 | 56.2 | 40.8 | 7039.7 |
| 18 J | 23.1 | 30,812 | 11.1 | 0.3 | 1.0 | 0.9 | 175.5 | 152.7 | 4054.8 |
| 19 Total | | 118.383 | | 1.000 | | | | | |

30

Estimation of the regression coefficients

In the Data menu, go to Data Analyses. In case this does not appear on the user's computer, consult Annex 1 for the installation of the required complement.

Next, select Regression. In the "Regression" window input the range of data of the column W*Y in "Y range of input." Then click on 🛐 and select the range of both columns: Weight (W) and Weighted RIDIT (X*W). Check the option "Constant equals zero" and select the output preferences as wanted.

In the Excel output, the X2 slope coefficient corresponds to the slope index of inequality.

| | | | | cientific data | | ip. | 12691.3 | 16631.7 | 8968.0 | 8211.1 | 12999.1 | 8801.4 | 4124.0 | 3489.9 | 2440.0 | 0.0 | 5258.4 | 0.0 | 3599.4 | 4899.5 | 7039.7 | 4054.8 | | | |
|----------------|--|---------------|------------|-----------------|------------------------|--------------------|---------|---------|--------|--------|---------|--------|--------|--------|--------|------|--------|------|--------|--------|---------|--------|----------|----|--|
| | alysis | 5 | sis Tools | financial and s | are - | 1 for add-in he | 3.7 | 6.6 | 6.1 | 9.1 | 28.1 | 28.4 | 27.3 | 22.9 | 35.3 | 30.1 | 52.1 | 39.8 | 54.6 | 42.6 | 40.8 | 152.7 | | | |
| | Solver | Analysi | Data Analy | Tools for | analysis. | Press F | 95.4 | 68.4 | 48.5 | 59.9 | 122.2 | 87.3 | 72.0 | 55.3 | 78.0 | 6.09 | 95.1 | 65.8 | 83.7 | 61.1 | 56.2 | 175.5 | | | |
| | | 3 | | | Weig | | ĺ | | | | | | | | | | | | | | | | | | |
| 4 | Hide D | | | 9 | RIDIT (X) | | 0.0 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.6 | 0.7 | 0.7 | 0.7 | 0.9 | | | |
| | Group Ungroup Subtot | Outline | | L | Imulative frequency | | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 1.0 | | | |
| | Consolidate What-If | | | ш | Relative Cu fromory | | 0.1 | 0.0 | 0:0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.3 | 1.000 | | |
| | Text to Remove Data (Columns Duplicates Validation • | Data Iools | | D | uity stratifer | nen illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 | | | |
| ew View | 24 24 Clear 24 Sort Filter 26 Reapply 24 Sort Filter 20 Advanced | SOLT & Filter | | C | ulation Equ | births Wor | 960 | ,681 | ,356 | ,587 | 1,926 | ,624 | 180 | ,059 | 220 | 712 | ,042 | ,335 | ,007 | 733 | 156 |),812 | 8,383 | | |
| Revie | tions ks | | | | Popu | Live | 6 | 4,6 | 2,3 | e, | 14, | 7,0 | 5, | 3,6 | 6,0 | e, | 9'6 | 4,5 | 7,0 | e, | с" С | 30, | 118 | | |
| Formula | Refresh Edit Lir | Connections | C1+D | | icator | v ratio (MMR) | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | | | |
| rt Page Layout | m Other Existing | il Data | | 8 | Health indì | Maternal mortality | | | | | | | | | | | | | | | | | | | |
| Home Inse | n From From | Get Externa | | A | raphical nit | strict | | | | | | | | | | | | | | | | | | | |
| File | From From Access Web | | Ĩ | - | Geogr | 2 Dis | е В | 4 N | 5 0 | 6 A | 7 L | 80 D | 9 M | 10 | 11 K | 12 B | 13 C | 14 E | 15 H | 16 F | 17 P | 18 J | 19 Total | 20 | |

Step ? **X** Data Analysis 6 Analysis Tools OK F-Test Two-Sample for Variances ٠ Fourier Analysis Cancel Histogram Moving Average Random Number Generation Help Rank and Percentile Ε Sampling t-Test: Paired Two Sample for Means Ŧ t-Test: Two-Sample Assuming Equal Variances

| regression | | |
|---|------------------|--------------|
| Input <u>Y</u> Range: | \$]\$3:\$]\$18 | OK Cancel |
| Input <u>X</u> Range: | \$H\$3:\$I\$18 | Help |
| Labels | Constant is Zero | |
| Confidence Level: | 95 % | |
| Qutput Range: Cutput Range: New Worksheet Ply: New Workbook Residuals Residuals | Recidual Plote | |
| Standardized Residuals | Line Fit Plots | |
| Normal Probability Plots | | |

| | А | В | С | D | E | F | G | н | I. |
|----|-------------------|--------------|----------------|----------|----------|----------------|--------------|--------------|--------------|
| 1 | SUMMARY OUTPUT | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | Regression St | atistics | | | | | | | |
| 4 | Multiple R | 0.920303424 | | | | | | | |
| 5 | R Square | 0.846958392 | | | | | | | |
| 6 | Adjusted R Square | 0.764598277 | | | | | | | |
| 7 | Standard Error | 3302.521423 | | | | | | | |
| 8 | Observations | 16 | | | | | | | |
| 9 | | | | | | | | | |
| 10 | ANOVA | | | | | | | | |
| 11 | | df | SS | MS | F | Significance F | | | |
| 12 | Regression | 2 | 845029514 | 4.23E+08 | 38.7392 | 3.33496E-06 | | | |
| 13 | Residual | 14 | 152693068.5 | 10906648 | | | | | |
| 14 | Total | 16 | 997722582.5 | | | | | | |
| 15 | | | | | | | | | |
| 16 | | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
| 17 | Intercept | 0 | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A | #N/A |
| 18 | X Variable 1 | 149.4576424 | 19.35422664 | 7.722222 | 2.06E-06 | 107.9469548 | 190.9683301 | 107.9469548 | 190.9683301 |
| 19 | X Variable 2 | -154.9763358 | 33.61284893 | -4.61063 | 0.000404 | -227.0687268 | -82.88394491 | -227.0687268 | -82.88394491 |

Interpretation of the index slope of inequality

For the data in the example, for that country in that year, there were 154 more maternal deaths per 100,000 live births among the most illiterate populations compared to the least illiterate populations considering the information of all the geographical units, and their population weights.

The sign in the slope index of inequality is frequently negative with impact health indicators, indicating that the left section of the distribution (socially worst-off units) shows higher levels of the indicator (i.e. maternal mortality) than the right section (socially best-off units). Thus the regression line displays a negative slope. The inverse usually happens with coverage health indicators. So, the slope index compares the socially best-off population with the socially worst-off; the inverse happens with the absolute gap of inequality, which is the reason why multiplying the slope index of inequality times (-1) allows the comparison in the same terms of the absolute gap.

In the statistical sense, the index will be negative (<0) whenever there is an inverse relationship between the health outcome and the RIDIT.

The magnitude of the index equals the absolute inequality (in this case, the difference) of maternal mortality ratio between the population with the highest and lowest analphabetism levels.

b. Slope index of inequality for grouped data

Step 1

Step 7

Construction of a table with the following columns, using the results obtained from the gap measures of inequality:

1) Group number

2) Group population

3) Relative frequency

4) Cumulative frequency5) RIDIT

Example:

| Group number | Group population | Relative frequency | Cumulative frequency | RIDIT |
|-----------------|------------------|-----------------------|-------------------------|-------|
| 1 | 2833 | | | |
| 2 | 2547 | | | |
| 3 | 6764 | | | |
| 4 | 5934 | | | |
| 5 | 908 | | | |

Step Calculation of the relative frequency for each group

Add up the population of all the groups, which will give the total population. Each group's population divided by the total population will give each group's relative frequency.

Example:

| | SUM | √ → ★ ✓ f _x =B2/B\$7 | | | | |
|---|--------------|---------------------------------|-----------------------|----------------------|-------|--|
| | А | В | С | D | E | |
| 1 | Group number | Group population | Relative frequency | Cumulative frequency | RIDIT | |
| 2 | 1 | 16133 | =B2/B\$7 | | | |
| 3 | 2 | 26137 | 0.221 | | | |
| 4 | 3 | 14316 | 0.121 | | | |
| 5 | 4 | 17089 | 0.144 | | | |
| 6 | 5 | 44708 | 0.378 | | | |
| 7 | | 118383 | | | | |
| 0 | | | T | | | |
| | | | | | | |

Step

3

2

Calculation of the cumulative frequency for each group

Example:

Excel

syntax

| | SUM | $- \left \begin{array}{c} \bullet & \times & \checkmark & f_x \\ \hline \end{array} \right =$ | D2+C3 | | | |
|---|-----------------|---|-----------------------|-------------------------|-------|---|
| | А | В | С | D | E | |
| 1 | Group number | Group population | Relative frequency | Cumulative frequency | RIDIT | |
| 2 | 1 | 16133 | 0.136 | 0.136 | | ľ |
| 3 | 2 | 26137 | 0.221 | =D2+C3 | | ĺ |
| 4 | 3 | 14316 | 0.121 | 0.478 | | |
| 5 | 4 | 17089 | 0.144 | 0.622 | | |
| 6 | 5 | 44708 | 0.378 | 1.000 | | |
| 7 | | 118383 | | | | |
| | | | | | | |

= GROUP POPULATION/ TOTAL POPULATION

Excel syntax

= relative frequency of each group + cumulative frequency of the previous group

Note: The cumulative for the first group will be its relative frequency. For the second and next groups, add the cumulative frequency of its previous one plus its relative frequency.

Step Calculation of the RIDIT for each group

Example:

4

| | SUM | ▼ (= X ✓ f _x = | (D3+D2)/2 | | |
|---|-----------------|---------------------------|-----------------------|-------------------------|------------|
| | А | В | С | D | E |
| 1 | Group number | Group population | Relative frequency | Cumulative frequency | RIDIT |
| 2 | 1 | 16133 | 0.136 | 0.136 | 0.068 |
| 3 | 2 | 26137 | 0.221 | 0.357 | =(D3+D2)/2 |
| 4 | 3 | 14316 | 0.121 | 0.478 | 0.418 |
| 5 | 4 | 17089 | 0.144 | 0.622 | 0.550 |
| 6 | 5 | 44708 | 0.378 | 1.000 | 0.811 |
| 7 | | 118383 | | | |
| - | | | | | |

Excel syntax = (cumulative frequency of each group + cumulative frequency of the previous group) / 2

Note: The RIDIT for the first group will be the cumulative frequency of the first group divided by half. For the second and following groups, sum up the cumulative frequency of the previous one plus the cumulative frequency of itself and divide the result by two

Step 5

Construction of a 7-column table

Example:

| | | | | - | | | |
|---|-----------------|-------|------|------------------|-------|-------|---------|
| | А | В | С | D | E | F | G |
| 1 | Group number | Y | х | Group population | w | W*X | W*Y |
| 2 | 1 | 172.5 | 0.07 | 16133 | 127.0 | 8.7 | 21915.4 |
| 3 | 2 | 109.0 | 0.25 | 26137 | 161.7 | 39.9 | 17618.7 |
| 4 | 3 | 47.5 | 0.42 | 14316 | 119.6 | 50.0 | 5683.7 |
| 5 | 4 | 29.3 | 0.55 | 17089 | 130.7 | 71.9 | 3825.0 |
| 6 | 5 | 38.2 | 0.81 | 44708 | 211.4 | 171.5 | 8077.3 |
| 7 | | | | 118383 | | | |
| | | | | | | | |

Excel syntax **To calculate the square root:** =RSQRT(each group population)

Note:

Group: number of each group (depends on the number of quantiles used) Y: health indicator for each group (obtained as in step 6 of the gaps measures) X: RIDIT of each group

Group population

W: the population weight (Square root of the population of each group) W*X: weighted RIDIT (the product of weight times the RIDIT of each group) W*Y: weighted health indicator (the product of weight times the health indicator of each group)

Step 6 🕨

Calculation of the slope index of inequality using Excel

Follow: DATA → Data analyses → Regression

DIn the "Regression" window input the range of data of the column W*Y in "Y range of input." Then click on and select the range of both columns: Weight (W) and Weighted RIDIT (X*W). Check the option "Constant equals zero" and select the output preferences as wanted.

On the Excel output, the X2 slope coefficient corresponds to the slope index of inequality.

Note 1: In case "Data Analyses" does not appear in your computer's menu, consult Annex 1 for the installation of the required complement.

| | d | ; |
|---|---|---|
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| | 2 | |
| | π | 5 |
| 1 | ? | ì |
| | _ | |

| | _ | | _ | | | | | | | | _ | | | | _ |
|-------------|-------------|-----------------------------|------------|---------------------|---|-----------|--------------|---------------------------|---------|--------|--------|--------|--------|----|---|
| | Conver | | Analysis | Data Analysis Tools | Tools for financial and scientific data | analysis. | 🎲 FUNCRES | Press F1 for add-in help. | | | | | | | |
| | Q | | 12 | | z | | | | | | | | | | |
| | | oup Subtotal | Outline | | Σ | | | | | | | | | | |
| | | Group Ungr | | | _ | | | | | | | | | | |
| | | idate What-If Analysis v | | | × | | | | | | | | | | |
| | | Data Consol dation * | ata Tools | | _ | | | | | | | | | | |
| | | Remove Duplicates Vali | Ő | | - | | | | | | | | | | |
| | | Ed Columns | | | н | | | | | | | | | | |
| | K Clear | er y Advance | Filter | | 9 | | Y*W | 21915.4 | 17618.7 | 5683.7 | 3825.0 | 8077.3 | | | |
| View | ZZ | Sort Filt | Sort & | | LL. | | X*W | 8.7 | 39.9 | 50.0 | 71.9 | 171.5 | | | |
| Review | lections 24 | inks Z | S | | ш | | > | 127.0 | 161.7 | 119.6 | 130.7 | 211.4 | | | |
| omulas Data | Conr | s All Sedit L | Connection | UM(D2:D6) | D | | o population | 16133 | 26137 | 14316 | 17089 | 44708 | 118383 | | |
| Page Layout | | r Existing Connection: | | <i>fx</i> =S | | | Group | 7 | 5 | 2 | 2 | 1 | | | |
| Insert | [] | From Othe Sources * | ernal Data | • | U | | × | 5 0.0 | 0 0.2 | 5 0.4 | 3 0.5 | 2 0.8 | | | |
| tome | * | From | Get Ext. | | 8 | | > | 172. | 109.4 | 47. | 1 29. | 38. | | | |
| H H | | ess Web | | D7 | A | Group | number | 1 | 2 | 3 | 4 | 5 | | | |
| - L | ¥ | Aco | | | | | - | 2 | m | 4 | S | 9 | 4 | 00 | |

| Analysis Tools F-Test Two-Sample for Fourier Analysis Histogram Moving Average Random Number Genera Rank and Percentile Regression Sampling t-Test: Paired Two Sam t-Test: Two-Sample Ass | Variances OK ation Help |
|--|---|
| Regression Input Input Y Range: Input X Range: Labels Labels Confidence Level: Output options Qutput Range: New Worksheet Ply: New Workbook Residuals Residuals Standardized Residuals Normal Probability Normal Probability Plots | \$G\$2:\$G\$6 \$E\$2:\$F\$6 \$E\$2:\$F\$6 Cancel Description P5 % |

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Step 6 🕨

| A B C D E F SUMMARY OUTPUT SumMary OUTPUT E F F Regression Statistics Multiple F 0.93435417 E F F Multiple F 0.93435011 F Statistics E F F F Multiple F 0.93435011 F Statistics F Statistics F Statistics Multiple F 0.93435011 F Statistics F Statistics F Statistics Adjusted 0.565580014 F Statistics F Statistics F Statistics Adjusted 0.565580014 F Statistics F Statistics F Statistics Adjusted 0.565580014 F Statistics F Statistics Statistics F Statistics Statistics F Statistics Statistics Statistics Statistics Statistics Statistics Statistics Statistics Statistatis | H 9 | | | | | | | | | ICE F | 3757 | | | 5% Upper 95% Lower 95.0% Upper 95.0% | A/N# A/N# A/N# | 77079 240.5928438 58.79937079 240.5928438 | 3.419489504 -314.3260207 3.419489504 |
|--|--------|---------|---------------|-------------------|-------------|-------------|------------|-----------|-------|------------|-------------------|--------------|-------------|--------------------------------------|----------------|---|--------------------------------------|
| A B C D E SUMMARY OUTPUT E C D E E Regression Statistics Multiple F 0.934185011 P F E | ш | | | | | | | | | Significan | 0571 0.05185 | | | ue Lower 95 | A #N/A | 1428 58.7993 | 1913 -314.326 |
| A B C SUMMARY OUTPUT C C SUMMARY OUTPUT Fegression Statistics C Multiple F 0.961345417 F R Square 0.924185011 F Adjusted 0.565580014 F Adjusted 0.55580014 F Adjusted 0.55580014 F Adjusted 0.56379355 A Regressio 3 604519355 Adjusted 149.6961073 F Numercept Adjosted A Adjosted Adjosted A | D | | | | | | | | | MS F | 7214678.4 18.2850 | 2817311.9 | | t Stat P-valı | //N# V/N# | 241110317 0.01352 | 13949087 0.0527 |
| A B SUMMARY OUTPUT Regression Statistics Multiple F 0.961345417 R Square 0.924185011 Adjusted 0.555580014 Standard i 4776.747 Observati 5 ANOVA df | C | | | | | | | | | SS | 834429356.8 41 | 68451935.7 2 | 902881292.5 | Standard Error | #N/A | 28.56190735 5.2 | 49.92158229 -3.1 |
| A SUMMARY Regression Multiple F R Square Adjusted i Standard i Observati ANOVA ANOVA ANOVA Regressio Residual Total Total | ۵ | OUTPUT | on Statistics | 0.961345417 | 0.924185011 | 0.565580014 | 4776.747 | 5 | | df | 2 | e | 5 | Coefficients 5 | 0 | 149.6961073 | -155 4532656 |
| | A | SUMMARY | Regressic | Multiple F | R Square | Adjusted I | Standard (| Observati | ANOVA | | Regressio | Residual | Total | | Intercept | X Variable | X Variahle |

Nota2:

El índice de la pendiente se debe calcular utilizando el Método de Mínimos Cuadrado Ponderados. Como EXCEL no tiene incorporado este método y solo el Método de Mínimos Cuadrados Ordinarios, se hace necesario calcular las nuevas variables: W, X*W & Y*W y usar estas con EXCEL para obtener los resultados deseados

Columna Y*W es el nuevo "Y" Columnas W más X*W es el nuevo "X"

Nota 3:

El valor del "X VARIABLE 2" es el índice de la pendiente.



Interpretation of the slope index of inequality

| Interpretation: | For the data in the example, for that country in that |
|-----------------|--|
| | year, there were 155 more maternal deaths per |
| | 100,000 live births among the provinces of the most |
| | illiterate group than in the less illiterate group, taking |
| | into consideration the information on the whole gradi- |
| | ent and their population weights. |

Note:

See steps 5, 6 and 7 of the slope index for non-grouped data for further explanation about the weighting and estimations using regression with Excel.

Preparation of the data table

through "cumulative frequency" In the case of retaining the same dataset, the user will be using the same Repeat steps 1-3 of the slope index for non-grouped data, or copy the table including the first six columns values as initial inputs.

| ц | Cumulative equency (cwPob) | | 0.077 | 0.116 | 0.136 | 0.167 | 0.293 | 0.357 | 0.401 | 0.427 | 0.478 | 0.509 | 0.586 | 0.622 | 0.682 | 0.713 | 0.740 | 1.000 | | |
|---|-------------------------------|--------------------------------|-------|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|---------|---|
| ш | Relative frequency fre | | 0.077 | 0.040 | 0.020 | 0:030 | 0.126 | 0.064 | 0.044 | 0.026 | 0.051 | 0.031 | 0.076 | 0.037 | 0.059 | 0.032 | 0.027 | 0.260 | 1.000 | |
| D | Equity stratifer | Women illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 1.11 | | |
| υ | Population | Live births | 9,096 | 4,681 | 2,356 | 3,587 | 14,926 | 7,624 | 5,180 | 3,059 | 6,077 | 3,712 | 9,042 | 4,335 | 7,007 | 3,733 | 3,156 | 30,812 | 118,383 | |
| 8 | Health indicator | Maternal mortality ratio (MMR) | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | | |
| A | Geographical unit | District | U | z | 0 | A | _ | 0 | Σ | _ | × | 8 | U | ш | I | LL | ٩ | _ | Total | |
| 1 | - | 2 | 3 | 4 | S | 9 | ~ | 00 | σ | H | H | 1 | 1 | 17 | 11 | H | 1 | 2 | 2 | ł |

c. Concentration index for non-grouped data

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To the table, add the following columns to the right:

- a) Health share (fHealth)
- b) Relative frequency of the health share (wHealth)
- c) Cumulative relative frequency of the health share (cwHealth)
- d) Health concentration index (HCI)

| | | | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ |
|---|---------------------------------|--------------------------------|---------|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|---------|
| - | HC | | | | | | | | | | | | | | | | | | |
| _ | cwHealth | | | | | | | | | | | | | | | | | | |
| н | wHealth | | | | | | | | | | | | | | | | | | |
| 9 | fHealth | | Ctrl) 🗸 | | | | | | | | | | | | | | | | |
| ш | Cumulative frequency (cwPob) | | 0.077 | 0.116 | 0.136 | 0.167 | 0.293 | 0.357 | 0.401 | 0.427 | 0.478 | 0.509 | 0.586 | 0.622 | 0.682 | 0.713 | 0.740 | 1.000 | |
| ш | Relative frequency | | 0.077 | 0.040 | 0.020 | 0:030 | 0.126 | 0.064 | 0.044 | 0.026 | 0.051 | 0.031 | 0.076 | 0.037 | 0.059 | 0.032 | 0.027 | 0.260 | 1.000 |
| D | Equity stratifer | Women illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 | |
| С | Population | Live births | 960'6 | 4,681 | 2,356 | 3,587 | 14,926 | 7,624 | 5,180 | 3,059 | 6,077 | 3,712 | 9,042 | 4,335 | 7,007 | 3,733 | 3,156 | 30,812 | 118.383 |
| В | Health indicator | Maternal mortality ratio (MMR) | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | |
| A | Geographical unit | District | g | z | 0 | A | _ | ٥ | × | _ | × | 8 | U | u | т | L | 4 | _ | Total |
| | | 0 | 00 | and a | 10 | 10 | | 00 | m | 0 | - | N | 3 | 4 | Sol 1 | 9 | | 00 | 5 |



Calculation of the health share for each geographical unit

Note:

it is necessary to extract the numerator of the health indicator for each geographical unit to graph the concentration curve with the cumulative share of health in the abscissa and the correspondent cumulative population share in the ordinate.

The numerator is obtained by solving for it in the equation defining the health indicator. Please note that different health indicators use different multiplying factors, i.e., the maternal mortality ratio uses 100,000 live births, but infant mortality uses 1,000 live births.

| MMD_ | (maternal deaths) | ×100.000 |
|---------|-------------------|------------|
| 1/11/11 | (Live births) | - ×100,000 |

Thus:

maternal deaths=

 $\frac{RMM}{100,000} \times live births$

(Next page)

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That is how the health share column (fHealth) is filled out. Under last unit's row, obtain the arithmetic sum of the health share.

| ABCDCDFCHII <th< th=""><th></th><th>SUM</th><th>▼ (* X ✓ ƒk =B3/100000*C3</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<> | | SUM | ▼ (* X ✓ ƒk =B3/100000*C3 | | | | | | | | |
|---|----|----------------------|--------------------------------|-------------|------------------|-----------------------|---------------------------------|----------|---------|----------|-----|
| 1 1 1Heath indicator builtPopulation fequency (xmoth iPerturbut icanRelative icanRel | 1 | A | 8 | C | D | ш | Ŀ | G | н | _ | - |
| 2 District Maternal montality ratio (MMR) Uve births Women illutacy 3 G maternal montality ratio (MMR) Uve births 0.007 0.007 0.007 0.007 4 N 133.1 9.096 3.44 0.007 0.017 0.007 0.017 5 N 23.60 32.4 0.007 0.016 13.38 5 N 23.61 32.1 0.030 0.167 4.92 7 L N 23.80 32.1 0.039 0.167 4.92 7 L N N 0.031 13.71 3.87 7.68 13.88 8 N N N 0.039 0.166 0.167 4.92 13.88 9 M N N N N 13.71 13.89 13.88 13.88 13.88 13.88 13.88 13.88 13.88 13.88 13.88 13.88 13.88 13.88 13.88 | + | Geographical unit | Health indicator | Population | Equity stratifer | Relative frequency | Cumulative frequency (cwPob) | fHealth | wHealth | cwHealth | HCI |
| 3 6 133.1 9.06 3.4.4 0.077 0.075 0.015 0.138 7.33 3.3 | 2 | District | Maternal mortality ratio (MMR) | Live births | Women illiteracy | | | | | | |
| 4 N 24.3 4.681 32.4 0.040 0.116 11.38 <th>e</th> <td>U</td> <td>133.1</td> <td>9,096</td> <td>34.4</td> <td>0.077</td> <td>0.077</td> <td>00000*C3</td> <td></td> <td></td> <td></td> | e | U | 133.1 | 9,096 | 34.4 | 0.077 | 0.077 | 00000*C3 | | | |
| 5 0 184.76 2,356 32.2 0.020 0.136 4,35 1 6 A 137.1 3,87 3.247 3.21 0.030 0.136 4,35 4,92 7 L 1064 14,926 3.21 0.030 0.147 4,92 5 9 M 27 5,80 27,14 27,24 0.23 5,88 6,97 7,58 5 | 4 | z | 243.09 | 4,681 | 32.4 | 0.040 | 0.116 | 11.38 | | | |
| 6 A 137.1 3,887 32.1 0.030 0.167 4,92 A 7 L 10 10.4 14,956 30.5 16.4 14,956 16.4 14,956 16.4 14,956 16.4 14,956 15.88 15.99 | ŝ | 0 | 184.76 | 2,356 | 32.2 | 0.020 | 0.136 | 4.35 | | | |
| | 9 | A | 137.1 | 3,587 | 32.1 | 0.030 | 0.167 | 4.92 | | | |
| 8 D 100.8 7.624 29.1 0.064 0.337 7.68 D 9 M 3.73 5.180 27.2 0.064 0.337 7.68 D 1 K 3.313 5.180 27.2 0.064 0.421 2.97 D 1 K 3.313 6.077 18.2 0.026 0.427 1.93 1 K 3.13 6.077 1.24 0.031 0.437 1.93 1 K 0.026 0.727 0.031 0.596 5.00 0.01 1 K 0.037 0.174 0.037 0.628 5.00 0.02 1 K 0.037 0.037 0.622 5.00 0.001 0.72 0.01 0.73 0.01 0.73 0.01 0.021 0.021 0.021 0.021 0.021 0.021 0.021 0.021 0.021 0.021 </td <th>2</th> <td>_</td> <td>106.4</td> <td>14,926</td> <td>30.5</td> <td>0.126</td> <td>0.293</td> <td>15.88</td> <td></td> <td></td> <td></td> | 2 | _ | 106.4 | 14,926 | 30.5 | 0.126 | 0.293 | 15.88 | | | |
| 9 M 57.3 5,180 27.2 0.044 0.401 2.97 N 10 1 6 6.31 3.059 2.66 0.026 0.427 1.93 N 11 K 31.3 6.077 1.82 0.031 0.472 1.93 N 12 B 0.07 1.82 0.031 0.677 1.93 N N 13 6.077 1.82 17.4 0.031 0.636 5.00 N <t< td=""><th>00</th><td>٥</td><td>100.8</td><td>7,624</td><td>29.1</td><td>0.064</td><td>0.357</td><td>7.68</td><td></td><td></td><td></td></t<> | 00 | ٥ | 100.8 | 7,624 | 29.1 | 0.064 | 0.357 | 7.68 | | | |
| | σ | Σ | 57.3 | 5,180 | 27.2 | 0.044 | 0.401 | 2.97 | | | |
| | 10 | _ | 63.1 | 3,059 | 26.6 | 0.026 | 0.427 | 1.93 | | | |
| | н | × | 31.3 | 6,077 | 18.2 | 0.051 | 0.478 | 1.90 | | | |
| | 12 | 8 | 0.0 | 3,712 | 17.4 | 0.031 | 0.509 | 0.00 | | | |
| 14 E 0.0 4,335 17.3 0.037 0.622 0.00 P 15 H 43.0 7,007 16.9 0.652 0.00 20 20 16 F 9.333 16.9 0.032 0.632 3.01 2.99 17 P 125.31 3,156 16 0.032 0.713 2.99 18 J 23.1 3,0812 11.1 0.027 0.740 3.55 18 J 20,812 11.1 0.260 1.000 7.12 18 J 118,333 1.833 1.000 7.12 3.50 | 13 | U | 55.3 | 9,042 | 17.4 | 0.076 | 0.586 | 5.00 | | | |
| | 14 | ш | 0.0 | 4,335 | 17.3 | 0.037 | 0.622 | 0.00 | | | |
| $ \begin{bmatrix} F & & & & & & & & & & & & & & & & & &$ | 15 | т | 43.0 | 7,007 | 16.9 | 0.059 | 0.682 | 3.01 | | | |
| 17 P 125.31 3,156 16 0.027 0.740 3,95 18 J 23.1 3,0812 11.1 0.260 1.000 7.12 15 Grad 11.3 0.260 1.000 7.12 1.000 | 16 | L | 80.2 | 3,733 | 16.8 | 0.032 | 0.713 | 2.99 | | | |
| 18 J 23.1 30,812 11.1 0.260 1.000 7.12 19 Total 11,8,383 11.3,383 1.000 85.20 85.20 | 17 | a | 125.31 | 3,156 | 16 | 0.027 | 0.740 | 3.95 | | | |
| 19 Total 118,383 1.000 85.20 | 18 | _ | 23.1 | 30,812 | 11.1 | 0.260 | 1.000 | 7.12 | | | |
| | 19 | Total | | 118,383 | | 1.000 | | 85.20 | | | |
| | 5 | | | | | | | | | | |

Calculation of the simple relative and cumulative relative health share

The simple relative (relative, for easy) frequency of health share (wHealth) equals the quotient between the health share of each unit divided by the total health share (arithmetic sum). As shown, using the "\$" sign, the value of the total share can be locked, and the syntax may be copied down to the rest of the units.

| | _ | | _ | _ | | | _ | | _ | | | | | | | | | | | | |
|----------------------|----|---------------------------------|--------------------------------|-----------|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|---------|----|
| | - | НСІ | | | | | | | | | | | | | | | | | | | |
| | _ | cwHealth | | | | | | | | | | | | | | | | | | | |
| | н | wHealth | | =G3/G\$19 | 0.134 | 0.051 | 0.058 | 0.186 | 060.0 | 0.035 | 0.023 | 0.022 | 0.000 | 0.059 | 0.000 | 0.035 | 0.035 | 0.046 | 0.084 | | |
| | ŋ | fHealth | | 12.10 | 11.38 | 4.35 | 4.92 | 15.88 | 7.68 | 2.97 | 1.93 | 1.90 | 0.00 | 5.00 | 0.00 | 3.01 | 2.99 | 3.95 | 7.12 | 85.20 | ı— |
| | u. | Cumulative frequency (cwPob) | | 0.077 | 0.116 | 0.136 | 0.167 | 0.293 | 0.357 | 0.401 | 0.427 | 0.478 | 0.509 | 0.586 | 0.622 | 0.682 | 0.713 | 0.740 | 1.000 | | |
| | ш | Relative frequency | | 0.077 | 0.040 | 0.020 | 0:030 | 0.126 | 0.064 | 0.044 | 0.026 | 0.051 | 0.031 | 0.076 | 0.037 | 0.059 | 0.032 | 0.027 | 0.260 | 1.000 | |
| | D | Equity stratifer | Women illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 | | |
| | c | Population | Live births | 9,096 | 4,681 | 2,356 | 3,587 | 14,926 | 7,624 | 5,180 | 3,059 | 6,077 | 3,712 | 9,042 | 4,335 | 7,007 | 3,733 | 3,156 | 30,812 | 118,383 | |
| 🔸 (* 🗙 🗸 🏂 =63/6\$19 | 8 | Health indicator | Maternal mortality ratio (MMR) | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | | |
| SUM | A | Geographical unit | District | IJ | z | 0 | A | _ | 0 | Σ | _ | × | - | U | ш | I | L | a. | _ | Total | |
| | 1 | - | 2 | m | 4 | ŝ | 9 | ~ | 00 | σ | 9 | H | 12 | 13 | 14 | 15 | 16 | 17 | 12 | 19 | 50 |

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The cumulative relative frequency of health share (cwHealth) equals the sum of two consecutive relative frequencies. A plus its own. The user can pull down the syntax to the lower rows, as in the last column. By way of verification, the column "zero" must be filled in the immediate row before the first geographical unit. That way the cumulative relative frequency of the first unit will equal zero plus its relative frequency. For the second, it will equal the relative frequency of the first cwHealth must add-up one (1.0).

| | - | th cwHealth HCI | | .142 0.142 | .134 =I3+H4 | .051 0.327 | .058 0.384 | .186 0.571 | .090 0.661 | .035 0.696 | .023 0.719 | .022 0.741 | .000 0.741 | .059 0.800 | .000 0.800 | .035 0.835 | .035 0.870 | .046 0.916 | .084 1.000 | | |
|--------------------|--------|---------------------------------|--------------------------------|------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|---------|----|
| | H 9 | fHealth wHeal | | 12.10 0 | 11.38 0 | 4.35 0 | 4.92 0 | 15.88 0 | 7.68 0 | 2.97 0 | 1.93 0 | 1.90 0 | 0.00 | 5.00 0 | 0.00 | 3.01 0 | 2.99 0 | 3.95 0 | 7.12 0 | 85.20 | |
| | L | Cumulative frequency (cwPob) | | 0.077 | 0.116 | 0.136 | 0.167 | 0.293 | 0.357 | 0.401 | 0.427 | 0.478 | 0.509 | 0.586 | 0.622 | 0.682 | 0.713 | 0.740 | 1.000 | | |
| | ш | Relative frequency | | 0.077 | 0.040 | 0.020 | 0.030 | 0.126 | 0.064 | 0.044 | 0.026 | 0.051 | 0.031 | 0.076 | 0.037 | 0.059 | 0.032 | 0.027 | 0.260 | 1.000 | |
| | D | Equity stratifer | Women illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 1.11 | | |
| | C | Population | Live births | 960'6 | 4,681 | 2,356 | 3,587 | 14,926 | 7,624 | 5,180 | 3,059 | 6,077 | 3,712 | 9,042 | 4,335 | 7,007 | 3,733 | 3,156 | 30,812 | 118,383 | |
| ◆ ○ X ◆ Jx = 3+H4 | 8 | Health indicator | Maternal mortality ratio (MMR) | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | | |
| SUM | A | Geographical unit | District | 5 | z | 0 | A | | ٥ | Σ | - | × | 8 | C | ш | 5 H | L | 7 P | [| 9 Total | 0 |
| | | - | 2 | 0 | 4 | S | 9 | ~ | 00 | σ | Ħ | H | H | 1 H | 14 | 1 | 1 | H | 15 | 1 | 2(|

Step 4 🕨

Estimation of the health concentration index (HCI)

Both cumulative relative frequencies of the population and health share columns will be the inputs to estimate the health concentration index using the Fuller formula of cross-product difference.

the cumulative relative frequency of health share of the second unit. The result is subtracted from the product of the cumulative relative frequency of population of the second unit times the cumulative relative frequency of health share of The HCI for the first unit will be the product of the cumulative relative frequency of population of the first unit times the first unit.

$HCI_1 = (cwpob_1 \times cwHealth_2) - (cwpob_2 \times cwHealth_1)$

| | | | | | - | 10 | ~ | ~ | - | C ¹ | ~ | | - | ~ | _ | ~ | - | ~ | - | - |
|---|---------------------------------|--------------------------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|--------|-------------|---|
| - | HCI | | t)-(I3*F4) | 0.00046047 | -0.00203341 | -0.01742035 | -0.01036463 | -0.01648535 | -0.00890061 | -0.02735932 | -0.02323013 | -0.02669317 | -0.02927801 | -0.02531568 | -0.00238161 | 0.00990438 | -0.17673391 | 0 | -0.35118694 | |
| - | cwHealth | | 0.142 | 0.276 | 0.327 | 0.384 | 0.571 | 0.661 | 0.696 | 0.719 | 0.741 | 0.741 | 0.800 | 0.800 | 0.835 | 0.870 | 0.916 | 1.000 | | |
| Ŧ | wHealth | | 0.142 | 0.134 | 0.051 | 0.058 | 0.186 | 060.0 | 0.035 | 0.023 | 0.022 | 0.000 | 0.059 | 0.000 | 0.035 | 0.035 | 0.046 | 0.084 | | |
| 0 | fHealth | | 12.10 | 11.38 | 4.35 | 4.92 | 15.88 | 7.68 | 2.97 | 1.93 | 1.90 | 00.0 | 5.00 | 0.00 | 3.01 | 2.99 | 3.95 | 7.12 | 85.20 | |
| u | Cumulative frequency (cwPob) | | 0.077 | 0.116 | 0.136 | 0.167 | 0.293 | 0.357 | 0.401 | 0.427 | 0.478 | 0.509 | 0.586 | 0.622 | 0.682 | 0.713 | 0.740 | 1.000 | | |
| ш | Relative frequency | | 0.077 | 0.040 | 0.020 | 0.030 | 0.126 | 0.064 | 0.044 | 0.026 | 0.051 | 0.031 | 0.076 | 0.037 | 0.059 | 0.032 | 0.027 | 0.260 | 1.000 | |
| ٥ | Equity stratifer | Women illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 | | |
| U | Population | Live births | 960'6 | 4,681 | 2,356 | 3,587 | 14,926 | 7,624 | 5,180 | 3,059 | 6,077 | 3,712 | 9,042 | 4,335 | 7,007 | 3,733 | 3,156 | 30,812 | 118,383 | |
| æ | Health indicator | Maternal mortality ratio (MMR) | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | | |
| A | Geographical unit | District | 5 | 7 | 0 | 4 | | 0 | 2 | | ~ | | 0 | | - | | 0 | | Total | |
| | | 2 | m | 4 | 5 | 9 | ~ | | 6 | 9 | - | 12 | 2 | 4 | 5 | 9 | 5 | 00 | 6 | Í |

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The fractional areas thus calculated are to be added to get the final HCI. In the example shown, the result is -0.35

| | | | _ | - | | | | | | | | | - | - | - | - | - | - | - | _ | |
|---------------------------|---|---------------------------------|--------------------------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|--------|-----------|----|
| | - | НС | | 0.00464444 | 0.00046047 | -0.00203341 | -0.01742035 | -0.01036463 | -0.01648539 | -0.00890061 | -0.02735932 | -0.02323013 | -0.02669317 | -0.02927801 | -0.02531568 | -0.00238161 | 0.00990438 | -0.17673391 | 0 | M(J3:J18) | |
| | - | cwHealth | | 0.142 | 0.276 | 0.327 | 0.384 | 0.571 | 0.661 | 0.696 | 0.719 | 0.741 | 0.741 | 0.800 | 0.800 | 0.835 | 0.870 | 0.916 | 1.000 | | |
| | т | wHealth | | 0.142 | 0.134 | 0.051 | 0.058 | 0.186 | 060.0 | 0.035 | 0.023 | 0.022 | 0.000 | 0.059 | 0.000 | 0.035 | 0.035 | 0.046 | 0.084 | | |
| | U | fHealth | | 12.10 | 11.38 | 4.35 | 4.92 | 15.88 | 7.68 | 2.97 | 1.93 | 1.90 | 0.00 | 5.00 | 0.00 | 3.01 | 2.99 | 3.95 | 7.12 | 85.20 | |
| | L | Cumulative frequency (cwPob) | | 0.077 | 0.116 | 0.136 | 0.167 | 0.293 | 0.357 | 0.401 | 0.427 | 0.478 | 0.509 | 0.586 | 0.622 | 0.682 | 0.713 | 0.740 | 1.000 | | |
| | ω | Relative frequency | | 0.077 | 0.040 | 0.020 | 0:030 | 0.126 | 0.064 | 0.044 | 0.026 | 0.051 | 0.031 | 0.076 | 0.037 | 0.059 | 0.032 | 0.027 | 0.260 | 1.000 | |
| | D | Equity stratifer | Women illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 | | |
| | U | Population | Live births | 960'6 | 4,681 | 2,356 | 3,587 | 14,926 | 7,624 | 5,180 | 3,059 | 6,077 | 3,712 | 9,042 | 4,335 | 7,007 | 3,733 | 3,156 | 30,812 | 118,383 | |
| 🔸 (* 🗙 🗸 fix =SUM(J3:J18) | ۵ | Health indicator | Maternal mortality ratio (MMR) | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | | |
| SUM | A | Geographical unit | District | U | z | 0 | A | | 0 | Σ | _ | × | | U | ш | т | L | ٩. | _ | Total | |
| | | | 2 | m | 4 | S | 9 | 5 | 00 | σ | 9 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

Step Interpretation of the HCI

Step

6

This complex measure makes a comparison in relative terms, between the share of population and the share of health (or disease) in a certain time and place. Thus it is a dimensionless measure. Theoretical values fluctuate among -1 (in the case a single person would concentrate the whole burden of disease) and +1 (in the case a single person would concentrate the whole health coverage). In practice, as referred by a bibliography(1), the HCI rarely exceeds [0.5]. Conventionally, values around [0.2] and [0.3] are interpreted as a reasonably high inequality.

In the presented example, an HCI=-0.35 indicates a considerably high inequality (>|0.3|) with a higher concentration of maternal deaths among the more illiterate population.

Another way of looking at it is finding approximately half of the cumulative population share and what is its corresponding (in this case) mortality share. In the example, 50.9% of the population is accumulated through Province "B" in cell F12. Its corresponding share of mortality is shown in cell I12, 74.1%. In other words, the most socially deprived half of the population shares more than half of the maternal deaths.

Finally, there is an alternative interpretation available(2). Multiplying the HCI times 75 equals the percentage of health (in this case maternal deaths) that would have to be redistributed among the less-burdened half of the population to achieve equality. Nevertheless, this translation might arise ethical concerns about the redistribution of disease burden /health coverage; as the aspirational goal is getting the entire population to experience the good health status of the most socially advantaged.

Plotting of the concentration curve

Copy the following columns in a separate spreadsheet with the following titles: Name of the geographic unit, the cumulative relative frequency of population (cwpob) and cumulative relative frequency of health (cwHealth). Add a column to the right named "Equity line." The three columns on the right should start with a zero and end with a one, as in the image. Note that the zero is written in the immediate row before the first geographical unit.

| | A | В | С | D |
|----|-------------------|---------------------------------|-----------------|-------------|
| 1 | Geographical unit | Cumulative frequency (cwPob) | cwHealth | Equity line |
| 2 | District | 0 | 0 | 0 |
| 3 | G | 0.0768 | 0.1421 | 0.0768 |
| 4 | N | 0.1164 | 0.2756 | 0.1164 |
| 5 | 0 | 0.1363 | 0.3267 | 0.1363 |
| 6 | A | 0.1666 | 0.3844 | 0.1666 |
| 7 | L | 0.2927 | 0.5708 | 0.2927 |
| 8 | D | 0.3571 | 0.6610 | 0.3571 |
| 9 | M | 0.4008 | 0.6959 | 0.4008 |
| 10 | 1 | 0.4267 | 0.7185 | 0.4267 |
| 11 | к | 0.4780 | 0.7409 | 0.4780 |
| 12 | В | 0.5093 | 0.7409 | 0.5093 |
| 13 | с | 0.5857 | 0.7995 | 0.5857 |
| 14 | E | 0.6223 | 0.7995 | 0.6223 |
| 15 | н | 0.6815 | 0.8349 | 0.6815 |
| 16 | F | 0.7131 | 0.8700 | 0.7131 |
| 17 | P | 0.7397 | 0.9165 | 0.7397 |
| 18 | 1 | 1 | 1 | 1 |

Select the cwpob column. Press the Ctrl key and hold it. Select the cwHealth column and continue holding the Ctrl key as the user selects the Equity line column.

| | Y | Wol | - | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|----|--------------------|-----------|-------|------|-------------------|--------|--------|--------|--------|------------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|--------|--------|------|-----|----|----|-----|----|----|
| | | Header & Footer | | | × | | | | | | | | | | | | | | Health | uity line | | | | | | | | | |
| | V | Text Box | | | _ | | | | | | | | | | | | | | 5 | Ű | | | | | | | | | |
| | Q3 | Hyperlink | Links | | | | | | | | | | | | | | | | | | | | | | | [| 1.2 | | |
| | | Slicer | Filter | | - | | | | | | | | | | | | | | | | | | | | | - | H H | | |
| | | Column Win/Loss | parklines | | н | | | | | | | | | | 5 | | | | | | | | | | | - | 0.8 | | |
| | 3 | Line | | | | 1 | | 1 | | | | | | | | | 2 | | | | | | | | | | Ŭ | | |
| | 0 | ther arts • | | 2 | 200 | 2 | No. | | | | hart Two | | | | | | | | | | | | | | | - | 0.4 | | |
| | | Scatter 0 | Scatter | 0 | •••• | | 2 | | × | K, | ALC OF | | | | | | | | | | | | | | | - | 0.2 | | |
| | 4 | Area | 2 | | | 1 | 3 | | | | | | | | | | | | | | | | | | | | • | | |
| N | | Bar ↓ | Charts | | ш | | | | | | 1.2 | | | - | | 0.0 | | | 0.0 | | 2 | 5 | | 0.2 | | | | | |
| Viev | | + Pie | | | | a | 0 | 768 | 164 | 363 | 666 | 927 | 571 | 008 | 267 | 780 | 093 | 857 | 223 | 815 | 131 | 397 | 1 | | | | | | |
| Review | Ş | Line + | | | ٥ | luity lin | | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | | | | | | | |
| ata | - | Column | | | | g | 0 | E | 9 | 1 | 4 | 8 | 0 | 6 | S | 6 | 6 | 5 | 5 | 6 | 0 | 5 | 1 | | | | | | |
| rmulas D | | Screenshot | | alth | U | cwHealth | | 0.142 | 0.275 | 0.326 | 0.384 | 0.570 | 0.661 | 0.695 | 0.718 | 0.740 | 0.740 | 0.795 | 0.795 | 0.834 | 0.870 | 0.916 | | | | | | | |
| t Fo | | martArt : | su | cwHea | | uency | • | 0.0768 | 0.1164 | 0.1363 | 0.1666 | 0.2927 | 0.3571 | 0.4008 | 0.4267 | 0.4780 | 0.5093 | 0.5857 | 0.6223 | 0.6815 | 0.7131 | 0.7397 | 1 | | | | | | |
| le Layout | | hapes Sr | lustratio | fx | 8 | /e frequ vPob) | | | Ű | Ű | Ű | Ű | Ű | Ŭ | Ű | Ű | Ű | Ű | Ű | Ű | Ű | Ű | | | | | | | |
| Pag | | Clip S Art | | | | mulativ (cv | | | | | | | | | | | | | | | | | | | | | | | |
| Insert | ् | icture | | • | | ujt Uli | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | | able | - | | A | phical u | strict | | | | | | | | | | | | | | | | | | | | | | |
| | | Table To | Tables | 5 | | seogra | D | | - | _ | _ | | _ | 5 | | | _ | | | - | | | | | | | | | |
| Ē | | Pivot | | | | 1 | 2 | m | 4 | 5 | 6 4 | 7 | 00 | 9 | 10 | 11 | 12 E | 13 (| 14 E | 15 F | 16 F | 17 F | 18 J | 19 | 20 | 21 | 22 | 23 | 24 |

Go to the Insert menu → Graph. Select scatterplot with smooth lines. Personalize the labels accordingly, considering:

- a) The relative cumulative frequency of population should be plotted on the abscissa axis (x) and the relative cumulative frequency of health on the ordinate axis (y)
- b) The range goes from 0 to 1
- c) One curve should be plotted for each analyzed year
- d) HCl < 0 correspond to a curve above the theoretical equity line, and HCl > 0 to a curve plotted below the theoretical equity line
- e) The absolute value of the HCI equals twice the area between the curve and the equity line

| | J | | | tified by | 62 000 | on curve | | | | | | | | concentration curve | | | | | | | ** ** | |
|-----------|----|---------------------------------|------------|----------------|--------|-----------|----------|--------|--------|--------|--------|--------|-------------|---------------------|--------|-----------------|--------|--------|-----|----------------|----------|---|
| | - | | | AR stra | | entratio | | • | | | | | | | | | | ' | - | y Illiteracy | | |
| | н | | | v in MN | , | y. Conce | r vear X | v mod | | 5 | | | | | | | | | 9.0 | ion ordered b | 9999 | |
| | IJ | | | inqualit | | Illiterac | ţ | 2 | | | | | | | | | | | 4.0 | are of populat | | |
| | L | | | Relative | | women | | | | | | | | | | | | | | cumultaive sh | | |
| | ш | | | | | | | | | ым | M 1 | 0 9J |) I EU S | 90 40 4 | itd | m 0.2 | no | 0 | | | 43 | |
| | D | Equity line | 0 | 0.0768 | 0.1164 | 0.1363 | 0.1666 | 0.2927 | 0.3571 | 0.4008 | 0.4267 | 0.4780 | 0.5093 | 0.5857 | 0.6223 | 0.6815 | 0.7131 | 0.7397 | 1 | | | |
| | c | cwHealth | • | 0.1421 | 0.2756 | 0.3267 | 0.3844 | 0.5708 | 0.6610 | 0.6959 | 0.7185 | 0.7409 | 0.7409 | 0.7995 | 0.7995 | 0.8349 | 0.8700 | 0.9165 | 1 | | | |
| ▲ () } | 8 | Cumulative frequency (cwPob) | 0 | 0.0768 | 0.1164 | 0.1363 | 0.1666 | 0.2927 | 0.3571 | 0.4008 | 0.4267 | 0.4780 | 0.5093 | 0.5857 | 0.6223 | 0.6815 | 0.7131 | 0.7397 | 1 | | | |
| Chart 1 | A | Geographical unit | 2 District | 5 | Z | 0 | 5 A | 7 L | D | Σ | 0 1 | 1 K | 2 B | 3 C | 4 E | 5 H | 6 F | 7 P | 8] | 6 | 0 | 1 |

d. Health concentration index for grouped data

In case there were outliers affecting the estimation of the HCI, one option is to group data using quantiles.

| Щ | ollow ste | ps 1-3 in HCI for n | on-grouped | l data or copy the | e table in c | ase the user | has al | ready | built it. |
|-----|----------------------|--------------------------------|-------------|--------------------|-----------------------|---------------------------------|---------|---------|-----------|
| | | | | | | | | | |
| | NUS | ► (► X ✔ JA =13+H4 | | | | | | | |
| | A | 8 | U | Q | w | u | 5 | Ŧ | - |
| e e | Geographical unit | Health indicator | Population | Equity stratifer | Relative frequency | Cumulative frequency (cwPob) | fHealth | wHealth | cwHealth |
| 2 | District | Maternal mortality ratio (MMR) | Live births | Women illiteracy | | | | | |
| m | 5 | 133.1 | 9'096 | 34.4 | 0.077 | 0.077 | 12.10 | 0.142 | 0.142 |
| 4 | z | 243.09 | 4,681 | 32.4 | 0.040 | 0.116 | 11.38 | 0.134 | =I3+H4 |
| ŝ | 0 | 184.76 | 2,356 | 32.2 | 0.020 | 0.136 | 4.35 | 0.051 | 0.327 |
| 9 | A | 137.1 | 3,587 | 32.1 | 0:030 | 0.167 | 4.92 | 0.058 | 0.384 |
| ~ | - | 106.4 | 14,926 | 30.5 | 0.126 | 0.293 | 15.88 | 0.186 | 0.571 |
| 00 | 0 | 100.8 | 7,624 | 29.1 | 0.064 | 0.357 | 7.68 | 060.0 | 0.661 |
| 6 | W | 57.3 | 5,180 | 27.2 | 0.044 | 0.401 | 2.97 | 0.035 | 0.696 |
| 9 | _ | 63.1 | 3,059 | 26.6 | 0.026 | 0.427 | 1.93 | 0.023 | 0.719 |
| 11 | × | 31.3 | 6,077 | 18.2 | 0.051 | 0.478 | 1.90 | 0.022 | 0.741 |
| 12 | 8 | 0.0 | 3,712 | 17.4 | 0.031 | 0.509 | 0.00 | 0.000 | 0.741 |
| 13 | 0 | 55.3 | 9,042 | 17.4 | 0.076 | 0.586 | 5.00 | 0.059 | 0.800 |
| 14 | u | 0.0 | 4,335 | 17.3 | 0.037 | 0.622 | 0.00 | 0.000 | 0.800 |
| 15 | н | 43.0 | 7,007 | 16.9 | 0.059 | 0.682 | 3.01 | 0.035 | 0.835 |
| 16 | ш | 80.2 | 3,733 | 16.8 | 0.032 | 0.713 | 2.99 | 0.035 | 0.870 |
| 17 | a | 125.31 | 3,156 | 16 | 0.027 | 0.740 | 3.95 | 0.046 | 0.916 |
| 12 | _ | 23.1 | 30,812 | 111 | 0.260 | 1.000 | 7.12 | 0.084 | 1.000 |
| 19 | Total | | 118,383 | | 1.000 | | 85.20 | | |
| 20 | | | | | | | | | |
| 21 | k value | cut-off point | | | | | | | |
| 22 | 0.2 | 16.9 | | | | | | | |
| 23 | 0.4 | 17.4 | | | | | | | |
| 24 | 0.6 | 27.2 | | | | | | | |
| 25 | 0.8 | 32.1 | | | | | | | |

Construction of a table as the one used in step 3 for HCI for non-grouped data

Step 1

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Grouping data

use the syntax =PERCENTILE.INC (range of the data on the equity stratifier, k). When using quintiles, k takes values 0.2, 0.4, 0.6 and 0.8. The image shows data grouped in quintiles, as well as the following steps. For details on grouping data, Data are grouped according to the distribution quantiles of the equity stratifier. To get the cut-off points of the distribution, see step 2 of the absolute gap of inequality.

| | | | _ | | | | | _ | | | | | _ | | _ | _ | | _ | | _ | | _ | _ | | _ | |
|-------|---------------------------------|----------------------------|--------|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|---------|----|---------------|---------------------------|------|------|------|--|
| - | cwHealth | | 0.142 | 0.276 | 0.327 | 0.384 | 0.571 | 0.661 | 0.696 | 0.719 | 0.741 | 0.741 | 0.800 | 0.800 | 0.835 | 0.870 | 0.916 | 1.000 | | | | | | | | |
| H | wHealth | | 0.142 | 0.134 | 0.051 | 0.058 | 0.186 | 060.0 | 0.035 | 0.023 | 0.022 | 0.000 | 0.059 | 0.000 | 0.035 | 0.035 | 0.046 | 0.084 | | | | | | | | |
| g | fHealth | | 12.10 | 11.38 | 4.35 | 4.92 | 15.88 | 7.68 | 2.97 | 1.93 | 1.90 | 0.00 | 5.00 | 0.00 | 3.01 | 2.99 | 3.95 | 7.12 | 85.20 | | | | | | | |
| Ľ | Cumulative frequency (cwPob) | | 0.077 | 0.116 | 0.136 | 0.167 | 0.293 | 0.357 | 0.401 | 0.427 | 0.478 | 0.509 | 0.586 | 0.622 | 0.682 | 0.713 | 0.740 | 1.000 | | | | | | | | |
| ш | Relative frequency | | 0.077 | 0.040 | 0.020 | 0:030 | 0.126 | 0.064 | 0.044 | 0.026 | 0.051 | 0.031 | 0.076 | 0.037 | 0.059 | 0.032 | 0.027 | 0.260 | 1.000 | | | | | | | |
| D | Equity stratifer | Women illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 11.1 | | | | | | | | |
| С | Population | Live births | 9'096 | 4,681 | 2,356 | 3,587 | 14,926 | 7,624 | 5,180 | 3,059 | 6,077 | 3,712 | 9,042 | 4,335 | 7,007 | 3,733 | 3,156 | 30,812 | 118,383 | | | | | | | |
| B | Health indicator | rnal mortality ratio (MMR) | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | | | point | NTILE.INC(D\$3:D\$18,A22) | 17.4 | 27.2 | 32.1 | |
| A | Geographical unit | District Mate | | | | | | | | | | | | | | | | | otal | | value cut-off | 0.2] =PERCE | 0.4 | 0.6 | 0.8 | |
| - | | 2 | 0 m | 4 N | 5 | 6 A | 7 L | 0 | 9 | 10 | 11 K | 12 B | 13 C | 14 E | 15 H | 16 F | 17 P | 18 J | 19 T | 20 | 21 k | 22 | 23 | 24 | 25 | |

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Obtaining the population share of each quintile

The columns for the equity stratifier and the population shares may be hidden, to improve visualization. Add three additional columns to the right:

- Population of the guintile: sum of the population of each of the geographical units included in the guintile
- Relative frequency (population) for the quintile: the population of each quintile divided by the total of the population
- The cumulative relative frequency (population) for the quintile: for quintile 1, this will equal zero plus the relative frequency of quintile 1. For quintile 2, this will equal the cumulative frequency of quintile 1 plus the relative frequency of quintile 2, and consecutively until quintile 5 which will add-up 1, as shown in the image. •

| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | NUN | + (> X < J × = | S+K8 | | | | | | | | | | |
|--|-------------|--------------------|-------------|------------------|--------------------|-------------------------|--------|-----------|----------|--------------|---------------------------------------|--------------------------------|--|
| Interface Population Equipy traiting Equipy traiting Equipy traiting Equipy traiting Conducting | A | - | U | ٥ | u | u | U | Ŧ | - | - | × | _ | |
| Interview MMR Volument literary Volument liter | ohical unit | t Health indicator | Population | Equity stratifer | Relative frequency | Cumulative frequency | Health | wHealth o | cwHealth | quintile pop | relative frequency of the quintile | cwpob of quintile ⁵ | |
| 1331 906 344 0007 1210 0142 0142 0134 1436 236 324 0.000 0.116 43 0.132 16133 0.134 164.5 13.66 0.00 0.116 43 0.03 0.013 0.134 104.4 13.67 0.23 0.030 0.157 43 0.03 0.013 104.4 13.67 0.030 0.157 43 0.030 0.014 0.03 1033 5.030 0.031 0.031 0.031 0.031 0.031 0.031 1033 5.030 0.031 0.031 0.031 0.031 0.031 0.031 1033 5.042 0.031 0.032 0.033 0.031 0.031 0.031 1033 5.042 0.031 0.033 0.033 0.031 0.031 0.031 1033 5.042 0.031 0.033 0.033 0.033 0.031 0.013 0.013 < | strict | MMR | Live births | Women illiteracy | | | | | | | | | |
| 1 2330 4641 2324 0.000 0.115 133 0.227 1613 0.136 133 0.136 133 0.136 133 0.136 133 0.136 133 0.136 0.136 133 0.136 <t< td=""><td></td><td>133.1</td><td>9,096</td><td>34.4</td><td>0.077</td><td>0.077</td><td>12.10</td><td>0.142</td><td>0.142</td><td></td><td></td><td></td><td></td></t<> | | 133.1 | 9,096 | 34.4 | 0.077 | 0.077 | 12.10 | 0.142 | 0.142 | | | | |
| 184.76 2356 322 0.000 0134 430 0136 <t< td=""><td></td><td>243.09</td><td>4,681</td><td>32.4</td><td>0.040</td><td>0.116</td><td>11.38</td><td>0.134</td><td>0.276</td><td></td><td></td><td></td><td></td></t<> | | 243.09 | 4,681 | 32.4 | 0.040 | 0.116 | 11.38 | 0.134 | 0.276 | | | | |
| 131 3.5% 2.1 0.00 0.15 4.20 0.05 0.34 1.01 0.02 0.03 0 | | 184.76 | 2,356 | 32.2 | 0.020 | 0.136 | 4.35 | 0.051 | 0.327 | 16,133 | 0.136 | 0.136 | |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | 137.1 | 3,587 | 32.1 | 0:030 | 0.167 | 4.92 | 0.058 | 0.384 | | | | |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | 106.4 | 14,926 | 30.5 | 0.126 | 0.293 | 15.88 | 0.186 | 0.571 | | | | |
| 73 5180 772 0.044 0.411 273 0.665 0.041 0.431 0.031 0.665 0.411 243 0.031 0.434 14316 0.131 313 6077 18.5 0.036 0.473 190 0.023 0.713 0.431 14316 0.131 533 942 1714 0.031 0.565 0.030 0.800 0.800 0.800 0.431 14316 0.131 0.0 742 1714 0.037 0.563 0.003 0.800 0.800 0.800 0.433 0.434 0.643 | | 100.8 | 7,624 | 29.1 | 0.064 | 0.357 | 7.68 | 060.0 | 0.661 | 26,137 | 0.221 | =L5+K8 | |
| 631 3059 566 0003 0.713 133 6071 133 6071 133 6071 133 6071 133 6071 133 6071 133 6071 133 6071 133 6071 133 6071 0131 033 133 0031 0359 000 0341 14316 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0335 0131 0132 0131 0132 0131 0132 0131 0132 0131 0132 0131 0132 0131 0132 0131 0132 0132 0132 0132 0131 0132 0132 0131 0132 0131 0132 | | 57.3 | 5,180 | 27.2 | 0.044 | 0.401 | 2.97 | 0.035 | 0.696 | | | | |
| 313 607 182 0031 0.435 103 0.431 14,316 0.111 0.436 553 9.02 3712 17.4 0.031 0.569 0.00 0.031 0.569 0.00 0.031 0.645 0.645 0.665 0.600 0.641 0.012 0.652 0.00 0.600 0.662 | | 63.1 | 3,059 | 26.6 | 0.026 | 0.427 | 1.93 | 0.023 | 0.719 | | | | |
| 10 3/12 1/14 0.031 0.595 0.00 0.741 0.001 0.741 0.001 0.741 0.001 0.741 0.001 0.741 0.001 0.741 0.001 0.741 0.001 0.741 0.001 0.741 0.001 0.001 0.001 0.001 0.001 0.001 0.013 0.013 0.013 0.013 0.014 | | 31.3 | 6,077 | 18.2 | 0.051 | 0.478 | 1.90 | 0.022 | 0.741 | 14,316 | 0.121 | 0.478 | |
| 533 9042 174 0.076 0.586 500 0.690 0.600< | | 0.0 | 3,712 | 17.4 | 0.031 | 0.509 | 0.00 | 0.000 | 0.741 | | | | |
| 10 433 173 003 0632 000 0607 1763 0144 0032 11 100 16.9 0039 0639 0630 | | 55.3 | 9,042 | 17.4 | 0.076 | 0.586 | 5.00 | 0.059 | 0.800 | | | | |
| 100 16.9 0.003 0.633 0.003 0.633 0.003 0.633 0.003 0.633 0.003 0.633 0.003 0.633 0.003 0.636 0.003 0.636 0.003 0.636 0.003 0.636 0.003 0.636 0.003 0.636 0.003 0.636 0.003 0.016 0. | | 0.0 | 4,335 | 17.3 | 0.037 | 0.622 | 0.00 | 0.000 | 0.800 | 17,089 | 0.144 | 0.622 | |
| 80.2 3.73 16.8 0.002 0.73 2.90 0.03 6.77 100 12.3 3.156 11 0.027 0.70 7.29 0.03 6.77 100 23.1 3.156 11 0.260 100 7.2 0.03 7.20 0.03 23.1 3.155 11 0.260 100 7.2 0.03 100 4.706 0.375 11.3 113.33 1 113.33 1.000 5.5.0 100 118.33 1 1000 13 113.33 1 1.333 1.000 5.5.0 100 7 1100 0.2 13.3 1.3 1.3 1.3 1.3 1.3 1.3 0.2 13.3 1.1 1.1 1.3 | | 43.0 | 7,007 | 16.9 | 0.059 | 0.682 | 3.01 | 0.035 | 0.835 | | | | |
| 123.1 3.156 16 0.027 0.340 335 1100* 1 3.13 3.11 0.11 0.240 3.25 0.644 0.035 0.375 1000* 1 113.33 11.1 0.200 0.240 1000 4.776 0.375 0.004 1000* 0.1011 113.333 11.333 11.333 11.333 1 1 100 10.5 1 0.01 0.15 0.01 <t< td=""><td></td><td>80.2</td><td>3,733</td><td>16.8</td><td>0.032</td><td>0.713</td><td>2.99</td><td>0.035</td><td>0.870</td><td></td><td></td><td></td><td></td></t<> | | 80.2 | 3,733 | 16.8 | 0.032 | 0.713 | 2.99 | 0.035 | 0.870 | | | | |
| 23.1 30.812 11.1 0.260 1000 71.2 0.378 0.378 1000 1 116,333 116,333 1000 55.20 1000 118,333 1 0.400 fightin 116,333 1000 55.20 1000 118,333 1 0.410 fightin 116,333 1 1000 55.20 1000 118,333 1 0.411 fightin 1< | | 125.31 | 3,156 | 16 | 0.027 | 0.740 | 3.95 | 0.046 | 0.916 | | | | |
| 11,333 1000 65.20 1000 118,333 1 ottoff point 0.0 118,333 1 1 1 0.1 0.2 16.9 1 1 1 1 0.2 16.9 1 1 1 1 1 1 0.2 16.9 1 | | 23.1 | 30,812 | 11.1 | 0.260 | 1.000 | 7.12 | 0.084 | 1.000 | 44,708 | 0.378 | 1.000 | |
| attoff point attoff point 0.2 17.4 0.4 17.4 0.6 27.2 0.8 32.1 0.8 32.1 | | | 118,383 | | 1.000 | | 85.20 | 1.000 | | 118,383 | 1 | | |
| 0.2 0.2 0.4 0.4 0.4 0.4 17.4 0.4 0.4 0.4 0.5 27.2 0.4 0.4 0.4 0.6 27.2 0.4 0.4 0.4 0.3 32.1 0.4 0.4 0.4 | | | | | | | | | | | | | |
| 02 169 03 77,3 06 77,3 08 32,1 08 32,1 | | cut-off point | | | | | | | | | | | |
| 0.4 11/4 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 | 0.2 | 16.9 | | | | | | | | | | | |
| 0.6 272 0.8 32.1 0.8 32.1 | 0.4 | 17.4 | | | | | | | | | | | |
| | 0.6 | 27.2 | | | | | | | | | | | |
| | 0.8 | 32.1 | | | | | | | | | | | |
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Step 4 🕨

Obtaining the health share of each quintile

Add two columns to the right:

- Relative frequency of health: equals the sum of the relative frequencies of the health of the units included in the quintile.
- quintile 2, this will equal the cumulative frequency of quintile 1 plus the relative frequency of quintile 2, and consecutively The cumulative relative frequency of health: for quintile 1, this will equal zero plus the relative frequency of quintile 1. For until quintile 5 which will add-up 1, as shown in the image.

| L | SLIM | ✓ = × ✓ f _k = | IS+MR | | | | | | | | | | | |
|----|------------------|--------------------------|-------------|------------------|--------------------|-------------------------|---------|---------|----------|--------------|---------------------------------------|-------------------|---|--|
| | | | | | | | | | | | | | | |
| 1 | A | | U | Q | ш | u. | 9 | Ŧ | _ | - | × | _ | Σ | z |
| H | Geographical uni | tt Health indicator | Population | Equity stratifer | Relative frequency | Cumulative frequency | fHealth | wHealth | cwHealth | quintile pop | relative frequency of the quintile | cwpob of quintile | share of health indicator for the quintile | cumulative share of health for the quintile |
| 2 | District | MMR | Live births | Women illiteracy | | | | | | | | | | |
| m | U | 133.1 | 960'6 | 34.4 | 0.077 | 0.077 | 12.10 | 0.142 | 0.142 | | | | | |
| 4 | z | 243.09 | 4,681 | 32.4 | 0.040 | 0.116 | 11.38 | 0.134 | 0.276 | | | | | |
| ŝ | 0 | 184.76 | 2,356 | 32.2 | 0.020 | 0.136 | 4.35 | 0.051 | 0.327 | 16,133 | 0.136 | 0.136 | 0.327 | 0.327 |
| 9 | A | 137.1 | 3,587 | 32.1 | 0.030 | 0.167 | 4.92 | 0.058 | 0.384 | | | | | |
| 1 | _ | 106.4 | 14,926 | 30.5 | 0.126 | 0.293 | 15.88 | 0.186 | 0.571 | | | | | |
| 00 | ٩ | 100.8 | 7,624 | 29.1 | 0.064 | 0.357 | 7.68 | 060.0 | 0.661 | 26,137 | 0.221 | 0.357 | 0.334 | =N5+M8 |
| 6 | Σ | 57.3 | 5,180 | 27.2 | 0.044 | 0.401 | 2.97 | 0.035 | 0.696 | | | | | |
| 10 | _ | 63.1 | 3,059 | 26.6 | 0.026 | 0.427 | 1.93 | 0.023 | 0.719 | | | | | |
| 11 | × | 31.3 | 6,077 | 18.2 | 0.051 | 0.478 | 1.90 | 0.022 | 0.741 | 14,316 | 0.121 | 0.478 | 0.080 | 0.741 |
| 12 | | 0.0 | 3,712 | 17.4 | 0.031 | 0.509 | 0.00 | 0.000 | 0.741 | | | | | |
| 13 | U | 55.3 | 9,042 | 17.4 | 0.076 | 0.586 | 5.00 | 0.059 | 0.800 | | | | | |
| 14 | ш | 0.0 | 4,335 | 17.3 | 0.037 | 0.622 | 0.00 | 0.000 | 0.800 | 17,089 | 0.144 | 0.622 | 0.059 | 0.800 |
| 15 | I | 43.0 | 7,007 | 16.9 | 0.059 | 0.682 | 3.01 | 0.035 | 0.835 | | | | | |
| 16 | L | 80.2 | 3,733 | 16.8 | 0.032 | 0.713 | 2.99 | 0.035 | 0.870 | | | | | |
| 17 | ٩ | 125.31 | 3,156 | 16 | 0.027 | 0.740 | 3.95 | 0.046 | 0.916 | | | | | |
| 10 | _ | 23.1 | 30,812 | 1.11 | 0.260 | 1.000 | 7.12 | 0.084 | 1.000 | 44,708 | 0.378 | 1.000 | 0.200 | 1.000 |
| 19 | Total | | 118,383 | | 1.000 | | 85.20 | 1.000 | | 118,383 | 1 | | 1.000 | |
| 20 | | | | | | | | | | | | | | |
| 21 | k value | cut-off point | | | | | | | | | | | | |
| 22 | 0.2 | 2 16.9 | | | | | | | | | | | | |
| 23 | 0.4 | 1 17.4 | | | | | | | | | | | | |
| 24 | 9.0 | 5 27.2 | | | | | | | | | | | | |
| ł | 0 | 1.15 | | | | | | | | | | | | |

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Estimation of the Health Concentration Index (HCI)

Two columns are needed: relative cumulative frequency of population, and relative cumulative frequency of health (columns L and N in the example)

The Fuller formula is applied here as in step 4 of HCI for non-grouped data.

the cumulative relative frequency of health share of the second quintile. The result is subtracted from the product of the cumulative relative frequency of population of the second quintile times the cumulative relative frequency of health share The HCI for the first quintile will be the product of the cumulative relative frequency of population of the first quintile times of the first quintile. Brackets should be used in the syntax to indicate the subtraction of products.

$HCI_1 = (cwpob_1 \times cwHealth_2) - (cwpob_2 \times cwHealth_1)$

The total HCI will equal the sum of the HCI of the quintiles.

| 2 | 2 | cumulative share of HCI health for the quintile | | | | 0.327]:)-(N5-L8) | | | 0.661 -0.051 | | | 0.741 -0.079 | | | 0.800 -0.177 | | | | 1.000 0.000 | -0.187 | | | | |
|---|---|--|------------------|-------|--------|------------------|-------|--------|--------------|-------|-------|--------------|-------|-------|--------------|-------|-------|--------|-------------|---------|---------------|------|------|----|
| 2 | Σ | share of health indicator for the quintile | | | | 0.327 | | | 0.334 | | | 0.080 | | | 0.059 | | | | 0.200 | 1.000 | | | | |
| - | | cwpob of quintile | | | | 0.136 | | | 0.357 | | | 0.478 | | | 0.622 | | | | 1.000 | | | | | |
| 2 | ۷ | elative frequency of the quintile | | | | 0.136 | | | 0.221 | | | 0.121 | | | 0.144 | | | | 0.378 | 1 | | | | |
| - | | uintile pop | | | | 16,133 | | | 26,137 | | | 14,316 | | | 17,089 | | | | 44,708 | 118,383 | | | | |
| - | - | wHealth q | | 0.142 | 0.276 | 0.327 | 0.384 | 0.571 | 0.661 | 0.696 | 0.719 | 0.741 | 0.741 | 0.800 | 0.800 | 0.835 | 0.870 | 0.916 | 1.000 | | | | | |
| - | | wHealth c | | 0.142 | 0.134 | 0.051 | 0.058 | 0.186 | 060.0 | 0.035 | 0.023 | 0.022 | 0.000 | 0.059 | 0.000 | 0.035 | 0.035 | 0.046 | 0.084 | 1.000 | | | | |
| e | 9 | fHealth | | 12.10 | 11.38 | 4.35 | 4.92 | 15.88 | 7.68 | 2.97 | 1.93 | 1.90 | 0.00 | 5.00 | 0.00 | 3.01 | 2.99 | 3.95 | 7.12 | 85.20 | | | | |
| | - | Cumulative frequency | | 0.077 | 0.116 | 0.136 | 0.167 | 0.293 | 0.357 | 0.401 | 0.427 | 0.478 | 0.509 | 0.586 | 0.622 | 0.682 | 0.713 | 0.740 | 1.000 | | | | | |
| | u | Relative frequency | | 0.077 | 0.040 | 0.020 | 0:030 | 0.126 | 0.064 | 0.044 | 0.026 | 0.051 | 0.031 | 0.076 | 0.037 | 0.059 | 0.032 | 0.027 | 0.260 | 1.000 | | | | |
| - | 2 | Equity stratifer | Women illiteracy | 34.4 | 32.4 | 32.2 | 32.1 | 30.5 | 29.1 | 27.2 | 26.6 | 18.2 | 17.4 | 17.4 | 17.3 | 16.9 | 16.8 | 16 | 111 | | | | | |
| c | ر | Population | Live births | 9,096 | 4,681 | 2,356 | 3,587 | 14,926 | 7,624 | 5,180 | 3,059 | 6,077 | 3,712 | 9,042 | 4,335 | 7,007 | 3,733 | 3,156 | 30,812 | 118,383 | | | | |
| a | • | Health indicator | MMR | 133.1 | 243.09 | 184.76 | 137.1 | 106.4 | 100.8 | 57.3 | 63.1 | 31.3 | 0.0 | 55.3 | 0.0 | 43.0 | 80.2 | 125.31 | 23.1 | | out-off point | 16.9 | 17.4 | |
| V | t | Geographical unit | District | 5 | z | 0 | A | - | 0 | ¥ | | × | 8 | 0 | u. | н | | ٩ | - | Total | k value c | 0.2 | 0.4 | 00 |

Bibliography

- 1. Donnell O, Wagstaff A, Lindelow M. Analyzing Health Equity Using Household Survey Data. Washington: World Bank; 2008. 95-96 p.
- 2. World Health Organization. Handbook on Health Inequality Monitoring. Hosseinpoor AR, editor. Luxembourg: World Health Organization; 2013. 105 p.

ANNEX 1

1

Instalation of the Analysis ToolPak Add-inn on Excel 2013.

Step In the Excel file, click on the File menu, tag Options. 'চ-∂-⊈--H File Home Page Layout Insert Draw Formulas X Calibri • 11 • A A = = = 87--B I U - ⊞ - 🏷 - A - ≡ ≡ ≡ 🖷 🖲 S Alic Clipboard 🗔 Font G. A1 Ŧ $\times \checkmark f_x$ D F 1 A В C Е 1 2 3 4 5 6 E Open New L Recent Open Shared with Me OneDrive S Sites Publish

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On the Options window, select Add-ins. In the dropdown menu at the bottom section of the window, select Manage Excel Add-ins, and the press Go.

-

| Excel Options | | | | | × ¿ |
|----------------------|---|--|---|--|--------|
| General Formulas | | View and manage Microsoft Office Add | d-ins. | | |
| Proofing | A | dd-ins | | | |
| Save | | Name ▲ | ocation | Type | • |
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| | | Document Related Add-ins No Document Related Add-ins | | | ł |
| | - | Add-in: Analysis ToolPak Publisher: Microsoft Corporation Compatibility: No compatibility information: Location: C:\Program Files\Microsoft Oft | available ffree\root\Office16\Library\Analysis\ANALYS | 332.XLL | |
| | | Description: Provides data analysis tools for | r statistical and engineering analysis | | |
| | | M <u>a</u> nage: Excel Add-ins 👻 Go | | | |
| | | | | Х | Cancel |

It will appear the Add-ins window. Click on the options "Analysis ToolPak", "Analysis ToolPak-VBA" and "Solver add-inn". And then, click on "Ok".



Step 4 🕨

You could check on the Data menu that now a new option appears: data Anlysis, where you can find the Regression tool needed to perform the step 6 for the Gradient measures of social inequality in health.

| | | Data Analysis Solver | nalysis | |
|---------------|----------------------|---|-------------|------|
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| Regression | | | |
| Sampling | | | |
| t-Test: Paired Two Sample for Means | > | | |

Every Woman Every Child Latin America and Caribbean (EWEC LAC) is the regional coordination mechanism for the Global Strategy for Women's, Children's and Adolescents' Health in the context of Latin America and the Caribbean. EWEC-LAC catalyzes and supports countries in their efforts to meet the goals and targets set out in the Global Strategy and align with the Sustainable Development Goals, with a focus on reducing social inequalities in health.

EWEC-LAC collaborates with key stakeholders in the region including governments, international development agencies, civil society representatives, academic institutions, professional institutions and non-governmental organizations to catalyze and support country-led efforts with the objective to reduce disparities in access to quality health services.



