Chapter 3.

Supporting the use of well-being indicators in Mexican states

This chapter introduces the well-being indicators to a broader audience through composite indices. Composite indices can be a useful tool for communication, since trends of multidimensional phenomena can be grasped more easily than across the many individual indicators. The chapter offers a summary picture of well-being in Mexican states obtained by normalising and aggregating the indicators for each dimension into a single score. Scores are defined on a relative scale, with the national averages at the most recent year equal to 100, which allows direct comparison among well-being dimensions and over time in a state. The chapter also discusses ways to improve the use of well-being indicators throughout the policy cycle (design, implementation and evaluation of policies). Finally, it provides indications of the statistical challenges ahead to improving the measurement of well-being at the sub-national level in Mexico.

Introduction

The development of a common framework and indicators to measure well-being at the sub-national level in Mexico can provide new evidence on the scale of regional differences in the country and help shape the policy debate at the federal and local levels. With the release of the data, the National Institute of Statistics and Geography (Instituto Nacional de Estadística y Geografía, INEGI) will develop a communication strategy to ensure that this statistical information is largely disseminated and communicated in a way that is easy to understand and to act upon for a broad audience. This chapter discusses the construction of composite indices that, providing aggregated information on well-being, can serve these communication purposes.

Beyond the dissemination of results, well-being indicators should support the design, implementation and evaluation of states' policies. This chapter discusses institutional conditions and governance for this to happen, based on some country and regional initiatives (OECD, 2014a). An inclusive process to engage different stakeholders is required. INEGI's contribution to this process may include methodological guidance to local governments in using statistical information for policy making. The chapter concludes with some recommendations on improvements in data gaps that will help the dissemination and use of well-being measures at the sub-national level.

Communicating multi-dimensional well-being through composite indices

In the past two decades, the debate on the measurement of multidimensional phenomena has generated renewed interest in the scientific community worldwide. While a consensus has been reached that phenomena like well-being, development, progress, poverty or competitiveness need to be measured by different dimensions and indicators, the discussion has not been settled on whether or how the various dimensions should be combined into a single summary measure (composite index).

The United Nations started in 1990 to compare countries' performance on the base of the Human Development Index, a single score based on the aggregation of indicators in the dimensions of income, education and health (UNDP, various years). Since then, various composite indices of human development have been put forward, covering a broad range of concepts and construction methods (Yang, 2014). Composite measures of multidimensional phenomena date back to the 1970s with the first attempts to modify the gross domestic product (GDP) single index (Nordaus and Tobin, 1972).

In the OECD Better Life Initiative to measure well-being both at the national and sub-national level, the entire dashboard of indicators is provided, together with a summary measure of each dimension (such as jobs, health, environment, safety, etc.) obtained by aggregating the individual indicators. A single composite index of well-being is not defined. Indeed, the OECD Better Life Index allows users to compare country performance on a single index by letting them choose the family of indices that fits best their value judgments on the weighting scheme (www.betterlifeindex.org). With this method, no controversial weighting scheme is imposed upon its users (Decancq, Decoster and Schokkaert, 2009). Many national statistical offices in OECD countries have developed well-being indicators systems at the national and sub-national levels with a similar approach of providing a dashboard of indicators, in some cases with summary well-being scores by dimension, but without a single well-being index (OECD, 2013; 2014a).[1]

However, composite indices are increasingly recognised as a useful tool for public communication, since common trends of a complex phenomenon can be grasped more easily than across many separate indicators. However, since the composite indices transform the underlying information and introduce hypotheses on the relations among the individual indicators, they can send misleading messages if the hypothesis and subjective assumptions are not thoroughly explained. Composite indicators can be a powerful means of initiating discussion and stimulating public interest. At the same time, their relevance should be gauged in an open debate with respect to the constituencies affected by the results (OECD/European Union/JRC, 2008).

Composite indices are formed by combining individual indicators on the basis of an underlying model, with the advantage of reducing the size of a set of indicators without losing the underlying information. By expressing the indicators and dimensions in the same unit of measurement, composite indices have the advantages, compared to a dashboard of indicators, of identifying easily how the various dimensions play out in a region and whether a region has improved performance over time compared to the rest of the country. When composite indices are put forward by national statistical offices, however, the underlying model and the transformations imposed on the indicators should be simple and clear enough to be replicated also by non-experts. Indeed, much of the credibility of the results proposed through a composite index relies on the trust in the soundness of the method and the clarity of the subjective hypothesis employed (for example on the weighting scheme among dimensions).

The critical issues in the construction of composite indices of well-being are linked to the different steps of construction of any measure that seeks to reduce the dimensions in space: the selection of individual indicators suitable to represent the phenomenon; the definition of the transformation function (normalisation) of the individual indicators; and the choice of the weights and the aggregation function of normalised indicators. A fundamental point, especially in the case of official statistics, is the clarity and simplicity of communication to a non-specialised audience of any choice and the method used for the measurement of the phenomenon. The different steps for constructing a composite index are reviewed in the next section.

Constructing a composite index

Constructing a composite index is a complex task, as it involves several alternatives and possibilities that affect the quality and reliability of the results. The main sequential steps to consider are the following (OECD/European Union/JRC, 2008):

- The first step implies the definition of a *theoretical model* that provides the basis for the selection of the single indicators. A formative model is assumed when the individual indicators included in the composite index are expected to cause the phenomenon under study (Diamantopoulos, Riefler and Roth, 2008).
- The second step involves *indicators selection*. Indicators should be chosen on the basis of their analytical soundness, measurability, country and regional coverage, relevance to the phenomenon being measured and relationship to each other. The selected indicators have different units of measure and different direction of correlation with the phenomenon under study.
- Through a method of *normalisation*, indicators are transformed into pure, dimensionless numbers and expressed in a way that an increase in the normalised indicator corresponds to an increase in the composite index.

- In the last step, the normalised indicators are *aggregated* to form one or more composite indices. The aggregation step requires the choice of the weighting system (importance of each individual indicator) and the identification of the technique (compensatory or non-compensatory) for summarising the values into a single number.
- Finally, the composite index should be *validated*, for example through a sensitivity analysis to explore the robustness of rankings to the inclusion and exclusion of certain indicators, to changes in the weighting system and to alternative transformation methods or decision rules (Freudenberg, 2003; Saisana, Saltelli and Tarantola, 2005).

The main factors to take into account in the choice of the aggregation method for summarising individual indicators are: type of indicators (substitutable/non-substitutable), type of aggregation (simple/complex), type of comparisons (absolute/relative) and type of weights (objective/subjective). Figure 3.1 shows a flow chart for the choice of the "best" method in constructing a composite index, with the different assumptions and requirements for each chosen path. However, there is not always a well-established solution, and it may be necessary to relax some requirements to satisfy others (Mazziotta and Pareto, 2013).

Type of indicators

The indicators are said to be substitutable if a deficit in one component may be compensated by a surplus in another (e.g. when measuring people's participation in a community, one may think that low values of participation in religious or spiritual activities can be offset by high values of participation in meetings of cultural or recreational associations). The components of an index are non-substitutable if a compensation among them is not allowed (e.g. a low value of "hospital beds per 1 000 people" cannot be offset by a high value of "hospital doctors per 1 000 people" and vice versa). An aggregation approach is said to be compensatory or non-compensatory depending on whether it permits compensability or not (Casadio, Tarabusi and Guarini, 2013). A non-compensatory approach implies that the single indicators (or the dimensions) should be balanced and an aggregation function that takes unbalance into account with a penalisation term is often used.

Aggregation of the indicators

An aggregation method is considered simple when an easily understandable mathematical function is used (e.g. the geometric mean in the Human Development Index). An aggregation method is said to be complex if a sophisticated model or multivariate statistical method is used (e.g. Principal Component Analysis). The clear advantage of a simple method is that it can be understood and replicated by anybody and thus increases the trust in the method by the general public. When the indicators are substitutable, the most used aggregation methods are the additive ones, for example arithmetic mean or Principal Component Analysis. When the indicators are non-substitutable, non-linear methods are preferred, such as multiplicative functions or Atkinsons's geometric means, which correspond to a partially compensatory approach, or Multicriteria Analysis, which corresponds to a non-compensatory approach (Munda and Nardo, 2009).

Type of comparisons

Another important issue is the level of comparability of the data across countries or regions and over time. Comparability of the composite index values first depends on the normalisation rule. All normalisation methods allow for space comparisons, whereas time comparisons may be difficult to make or to interpret. Comparisons over time may be *absolute* or *relative*. A time comparison is relative when the values of the composite index at a certain time depend on one or more endogenous parameters (for example the mean and variance of individual indicators at time *t*). A time comparison is instead absolute when the values of the composite index at a certain time depend on one or more exogenous parameters (for example minimum and maximum values of the individual indicators fixed by the researcher). Ranking and standardisation allow only for relative comparisons since they are based exclusively on values of the individual indicators at time *t*. Other methods, such as rescaling or indexation, require that the minimum and maximum values are independent from the time *t*, in order to perform comparisons in absolute terms (Tarantola, 2008).

Type of weights

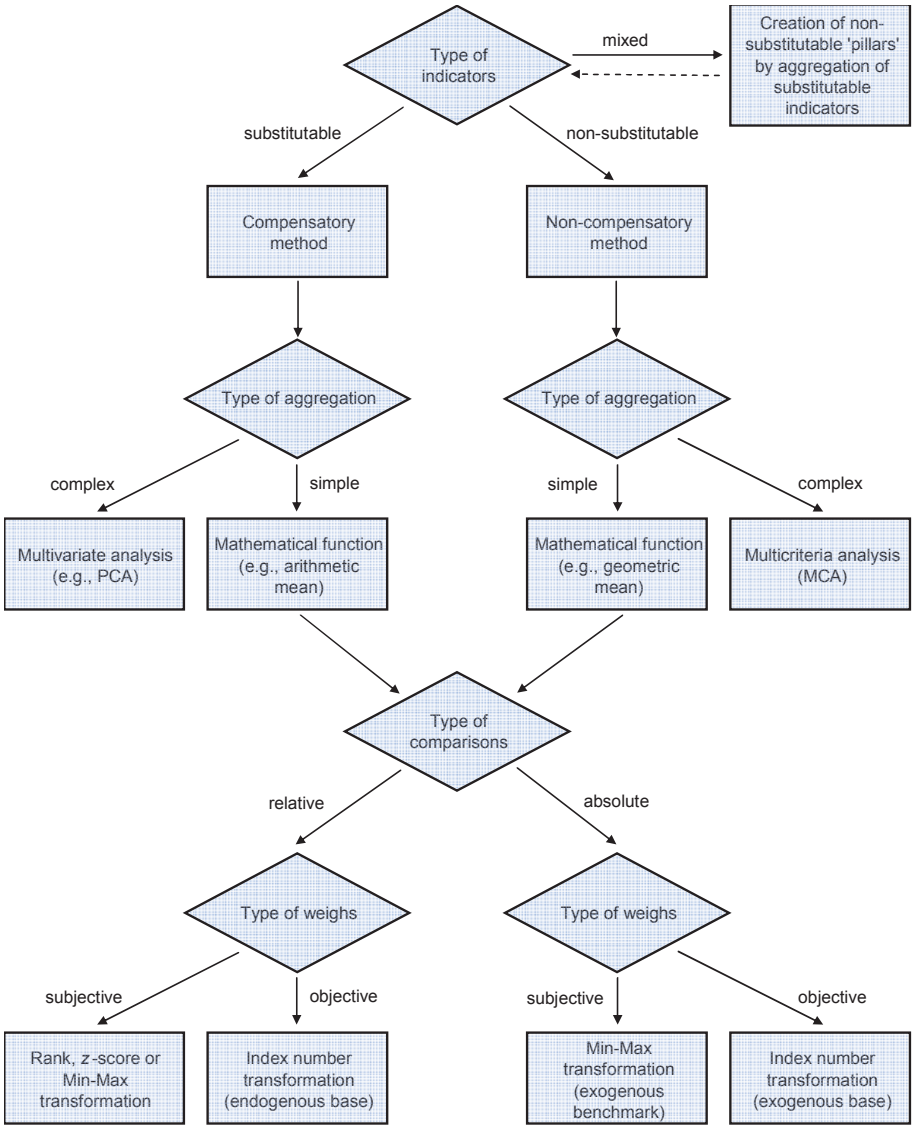
The choice of the weighting system for the individual indicators and the various dimensions necessarily introduces an arbitrary component as it represents a value judgment on their relative importance. In the absence of statistical or empirical grounds for choosing different weights, a common approach is to assign the same weight to all the components (Booysen, 2002; Jacobs, Smith and Goddard, 2004). For example, an equal weighting scheme is used to aggregate the individual indicators within each dimension in the OECD Better Life Initiative both at the national and regional levels and in the UN Human Development Index. A weighting scheme can be implicitly defined according to the normalisation function chosen. For example, the indexation assigns a weight proportional to the variability of the indicator and thus indicators with low variability will have less weight than indicators with high variability. Alternatively, subjective weights can be set through participatory methods or social surveys that include policy makers, experts and citizens. An open discussion to define the weighting system is particularly feasible and relevant when the well-being indicators are linked to a national or regional policy.

The choice of weights influences the normalisation method for the indicators. For relative comparisons with subjective weighting (equal or different weights), normalisation by ranking, z-score or rescaling is recommended. For absolute comparisons, it is not possible use ranking or standardisation. In the case of subjective weighting, it is necessary to resort to a Min-Max transformation with minimum and maximum values independent of the distribution (exogenous benchmark), whereas in the case of objective weighting, an indexation with externally fixed base may be a good solution (exogenous base).

In the next section, a composite index is constructed to measure well-being in Mexican states, applying the dimensions and indicators described in Chapter 1. The "path" followed in the choice of the method is based on the following requirements: 1) simplicity of the aggregation function; 2) possibility to perform absolute comparisons across the Mexican states, among the well-being dimensions, and over time; 3) subjective weighting (equal weights for all the indicators in a dimension). Since the set of 35 indicators included in the INEGI well-being website have been chosen through experts' meetings, they represent in this exercise the "best" available set to measure

regional well-being in the Mexican states; therefore the indicators are assumed to be non-substitutable among themselves and they are all included in the composite index.

Figure 3.1. **Flow chart for the choice of the 'best' method to build a composite index**



Source: Mazziotta and Pareto (2013).

Composite indices of well-being in Mexican states

For each of the 12 well-being dimensions a composite index has been computed, aggregating the indicators to provide a single score that is comparable across states, among well-being dimensions and over time. In the index chosen, called Adjusted Mazziotta-Pareto Index (AMPI), the national values at the latest available year are set equal to 100, so that values above (below) 100 mean better (worse) performance than the country value. The values of the index vary in the open interval 70 and 130 (Mazziotta and Pareto, 2012). The composite indices are computed for the years 2014 (or latest available year) and 2008 (or first available year).[2]

The AMPI index (or score) of a well-being dimension is a function of the mean values of the individual indicators and their variability to take into account differences in achievement across indicators. Such a choice implies a limited substitutability among indicators, that is to say, a low achievement in one indicator (for example employment in the job dimension) is not linearly compensated for by high achievement in another indicator (for example critical working condition in the same dimension), as it would be if the simple arithmetic mean were used. A detailed description of the method, together with a sensitivity analysis of the results, is described in Annex 3.A1.

Well-being in Mexico varied from the minimum values of 70 for housing in Chiapas and life satisfaction in Guerrero to the maximum value of 130 for life satisfaction in Coahuila. Baja California Sur, Sinaloa and Tamaulipas perform better than the national average in all of the well-being dimensions, while in the state of Guerrero, only the dimension civic engagement and governance is above the country value (Table 3.1). The observed variability among the state scores in a dimension is partially dependent on the number of individual indicators included. For example, life satisfaction and social connections, which are measured by one indicator each, are the dimensions with the largest differences among states; while health, which is measured by five indicators, has the smallest. Notwithstanding this limitation, a snapshot of a state's well-being is provided comparing well-being scores across the 12 dimensions (Annex A). While expected outcomes are confirmed in the well-being of a state, (for example better than average education is usually associated with better scores in the job dimension), in other cases this information helps to show where positive spill-over among dimensions are not in place, or where self-reported well-being does not correspond to the picture portrayed by the other objective conditions. Baja California, for example, ranks 1st in environment and 2nd in income, but 26th in education, health and safety. Residents of San Luis Potosi reported very low values of satisfaction with life and social connections, while outcomes in housing, jobs, safety, education, civic engagement, health and work-life balance were above the national averages.

Well-being in Mexico has improved in most of the dimensions, notably in health, accessibility to services and housing, areas where the scores increased by more than 10 points between 2000 and 2013. Baja California, Hidalgo, Queretaro and Yucatan had the largest improvements in health between 2000 and 2013, although they remain below the country's average in 2013, with the exception of Queretaro. Access to services has improved the most in Puebla since 2008, although there is still scope for catching up with the other states since Puebla ranks 27th out of the 32 states in 2013. Regional differences in accessibility to services and health have narrowed since 2000, mainly thanks to the reduction of maternity and infant mortality rates and better access to basic services in the lagging states.

In the past decade, well-being in Mexico has, on average, worsened in terms of safety, income and jobs; extremely poor conditions concentrated in a number of states, such as Guerrero and the State of Mexico explain the deterioration of security over the past five years, while the worsening in employment situation, although less severe than the security situation, have been spread across a majority of states in the past ten years. Income has deteriorated since 2008, and in states where income has increased, inequalities have also increased (Table 3.1).

Table 3.1. **Well-being scores, 2014 or latest available year**

State	Housing	Income	Jobs	Access to services	Safety	Education	Environment	Civic engagement and governance	Health	Life satisfaction	Work-life balance	Social connections
Aguascalientes	114.4	108.6	101.9	108.7	115.8	103.2	112.5	98.2	105.4	91.1	83.5	111.3
Baja California	93.7	120.0	106.4	106.6	96.1	89.0	114.3	90.6	92.7	105.8	107.7	116.7
Baja California Sur	101.4	115.9	111.2	106.7	111.5	106.8	110.6	103.9	100.5	108.4	113.0	127.9
Campeche	85.5	103.1	103.0	97.8	108.8	96.4	99.7	113.2	89.2	101.6	105.2	84.3
Chiapas	69.4	78.2	80.8	80.0	108.9	82.8	90.8	112.1	93.4	96.1	107.1	103.0
Chihuahua	99.5	108.8	112.9	107.7	91.2	90.8	111.1	97.6	92.6	100.2	119.9	104.7
Coahuila	109.5	108.9	107.9	104.9	105.7	90.6	105.2	104.0	104.1	129.5	113.4	94.4
Colima	101.2	112.5	108.4	111.8	107.3	104.8	97.0	108.6	102.1	104.6	111.0	125.3
Durango	101.6	104.0	95.4	100.4	104.0	88.3	107.6	107.2	101.5	99.2	111.6	109.0
Federal District	117.9	115.4	97.3	111.0	90.1	113.3	103.6	86.5	101.3	84.1	88.1	108.3
Guanajuato	101.5	103.1	100.3	100.6	105.1	88.1	95.0	87.2	100.7	98.4	82.3	90.3
Guerrero	76.6	88.1	94.8	79.3	87.9	90.7	92.7	102.9	89.3	69.5	76.9	95.7
Hidalgo	101.4	94.0	95.2	95.4	107.6	88.7	84.3	100.2	98.4	100.7	90.0	95.0
Jalisco	109.3	110.9	104.7	106.2	104.3	114.7	103.1	100.6	105.9	102.5	110.2	86.3
Michoacan	95.8	95.1	98.7	90.8	102.9	94.1	88.5	97.0	100.5	99.4	110.6	111.3
Morelos	103.3	99.0	100.1	102.0	91.7	88.5	69.8	89.7	99.6	83.6	95.4	113.3
Nayarit	103.8	105.5	98.3	103.6	110.9	114.6	102.3	116.7	99.5	107.3	115.1	95.0
Nuevo Leon	114.1	123.5	107.7	113.8	110.6	96.5	111.4	97.7	107.2	116.2	110.8	90.2
Oaxaca	79.0	83.8	93.0	78.7	108.2	87.9	76.7	103.0	84.0	84.3	87.5	102.2
Puebla	94.6	79.6	95.1	92.4	104.3	99.9	100.9	90.9	95.1	90.3	90.8	89.1
Queretaro	106.8	109.2	99.1	102.2	112.2	100.4	95.4	103.6	105.2	113.1	89.9	115.0
Quintana Roo	95.5	107.5	110.2	107.0	102.0	110.0	111.2	96.0	95.8	99.3	94.6	80.6
San Luis Potosi	101.9	98.7	103.1	96.0	104.7	101.0	98.3	106.9	103.1	88.1	104.4	79.5
Sinaloa	107.6	106.5	100.4	103.7	102.0	114.3	108.9	102.3	106.6	107.3	111.8	107.7
Sonora	101.9	114.9	109.5	109.2	104.1	99.6	99.1	98.9	103.1	115.6	114.0	113.9
State of Mexico	104.4	102.3	93.9	100.9	75.8	96.8	91.8	91.4	102.9	102.4	88.3	91.0
Tabasco	80.4	101.5	91.9	93.7	94.2	101.1	91.9	102.2	92.0	116.1	93.6	105.9
Tamaulipas	103.7	107.2	103.6	104.1	104.3	102.5	106.9	106.3	100.0	110.6	111.8	107.9
Tlaxcala	103.5	97.0	90.2	99.2	107.6	97.8	105.4	95.5	102.2	79.1	75.8	88.5

Table 3.1. **Well-being scores, 2014 or latest available year** (*cont.*)

State	Housing	Income	Jobs	Access to services	Safety	Education	Environment	Civic engagement and governance	Health	Life satisfaction	Work-life balance	Social connections
Veracruz	86.7	91.9	93.2	88.5	103.8	103.0	90.0	99.3	92.6	92.7	102.2	116.2
Yucatan	101.8	99.7	105.4	98.4	119.4	98.5	105.5	117.8	93.2	106.4	97.4	67.9
Zacatecas	103.7	93.2	94.0	98.7	107.9	94.7	100.1	113.2	102.2	104.6	101.3	92.0
Mexico (Country)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Notes: From the set of 35 indicators presented in Chapter 1, the indicator on extreme poverty, being a subset of the indicator on poverty (income dimension), and the indicator on students' assessment in the PISA test, for lack of data in the states of Michoacan, Oaxaca and Sonora, are excluded. The indicators of satisfaction with life (life satisfaction), quality of support network (community or social connections), civic and political participation (civic engagement and governance), self-reported health (health) and satisfaction with time for leisure (work-life balance) are the same in both the baseline and the latest year since they are only available for 2012. The full list of indicators with their respective baseline and latest available year are presented in Annex 3.A1.

Table 3.2. **Well-being scores, first available year**

State	Housing	Income	Jobs	Access to services	Safety	Education	Environment	Civic engagement and governance	Health	Life satisfaction	Work-life balance	Social connections
Aguascalientes	104.7	103.4	102.3	97.0	102.9	99.5	109.0	98.7	94.9	91.1	82.3	111.3
Baja California	78.3	118.4	121.0	96.0	103.0	87.8	112.8	89.9	87.4	105.8	112.7	116.7
Baja California Sur	89.0	116.9	117.1	95.6	111.7	98.9	109.8	103.8	101.6	108.4	117.3	127.9
Campeche	73.5	96.4	102.1	88.1	110.3	91.1	89.7	113.1	88.0	101.6	106.2	84.3
Chiapas	59.8	73.4	80.4	64.2	112.6	81.8	88.5	95.6	73.2	96.1	107.0	103.0
Chihuahua	89.0	100.7	118.4	91.2	90.2	85.1	107.8	92.4	86.3	100.2	125.8	104.7
Coahuila	102.1	112.1	107.0	96.7	110.9	88.3	99.1	99.8	99.4	129.5	110.8	94.4
Colima	87.5	117.1	112.5	100.6	115.2	89.1	93.8	110.0	94.9	104.6	110.0	125.3
Durango	95.9	96.2	101.4	82.8	102.5	83.3	106.0	96.6	92.5	99.2	112.0	109.0
Federal District	108.9	113.5	103.5	94.1	90.6	109.5	100.5	84.4	91.8	84.1	84.2	108.3
Guanajuato	88.2	104.8	98.7	82.1	109.9	78.4	90.3	91.1	86.9	98.4	85.8	90.3
Guerrero	65.7	82.0	93.7	60.0	101.8	87.4	91.6	93.4	67.4	69.5	78.2	95.7
Hidalgo	86.3	93.4	93.7	72.3	108.7	83.3	79.7	107.7	85.6	100.7	88.7	95.0
Jalisco	100.6	111.0	109.8	90.0	109.3	101.6	101.1	98.4	95.5	102.5	108.9	86.3
Michoacan	83.0	95.7	96.9	68.4	102.3	87.3	84.6	99.4	87.6	99.4	109.6	111.3

Table 3.2. **Well-being scores, first available year** (*cont.*)

State	Housing	Income	Jobs	Access to services	Safety	Education	Environment	Civic engagement and governance	Health	Life satisfaction	Work-life balance	Social connections
Morelos	89.5	102.6	102.1	86.3	98.4	85.3	65.7	89.1	91.0	83.6	94.5	113.3
Nayarit	92.3	104.3	104.0	89.2	107.1	96.7	96.7	112.0	87.7	107.3	115.3	95.0
Nuevo Leon	106.5	118.6	111.2	99.3	102.7	89.0	106.2	95.7	101.7	116.2	108.6	90.2
Oaxaca	66.9	85.9	92.4	57.5	107.3	78.1	76.5	97.6	66.0	84.3	87.6	102.2
Puebla	81.7	91.7	95.5	64.7	103.0	92.7	98.5	87.6	76.6	90.3	88.8	89.1
Queretaro	91.8	105.2	107.0	91.5	115.8	92.7	92.9	103.4	85.8	113.1	92.6	115.0
Quintana Roo	81.9	109.7	120.0	93.0	99.6	96.6	104.5	99.8	79.9	99.3	96.8	80.6
San Luis Potosi	90.1	95.0	100.3	79.8	105.0	94.2	91.5	111.4	86.4	88.1	103.7	79.5
Sinaloa	96.9	107.9	109.3	90.5	102.9	100.8	108.6	96.4	100.4	107.3	111.7	107.7
Sonora	92.4	114.3	110.8	96.7	105.6	92.1	97.7	105.4	93.8	115.6	117.7	113.9
State of Mexico	92.0	109.5	97.1	82.1	89.1	93.8	90.8	89.7	83.0	102.4	84.7	91.0
Tabasco	69.9	90.1	95.3	84.6	98.5	94.0	88.8	99.6	86.8	116.1	87.7	105.9
Tamaulipas	92.9	106.5	107.9	93.7	105.3	95.8	94.5	106.9	91.0	110.6	111.3	107.9
Tlaxcala	89.1	96.6	91.7	76.4	107.2	92.8	104.6	90.9	83.8	79.1	75.3	88.5
Veracruz	75.6	93.9	93.0	71.4	105.8	85.1	88.3	100.0	78.1	92.7	100.5	116.2
Yucatan	86.6	101.5	102.1	84.7	115.7	90.9	103.7	113.6	90.1	106.4	96.8	67.9
Zacatecas	96.1	91.7	97.1	83.8	107.9	88.0	91.1	105.9	86.0	104.6	101.8	92.0
Mexico (Country)	89.0	100.3	102.5	83.1	102.6	93.4	97.1	98.1	87.1	100.0	99.3	100.0

Notes: From the set of 35 indicators presented in Chapter 1, the indicator on extreme poverty, being a subset of the indicator on poverty (income dimension), and the indicator on students' assessment in the PISA test, for lack of data in the states of Michoacan, Oaxaca and Sonora, are excluded. The indicators of satisfaction with life (life satisfaction), quality of support network (community or social connections), civic and political participation (civic engagement and governance), self-reported health (health) and satisfaction with time for leisure (work-life balance) are the same in both the baseline and the latest year since they are only available for 2012. The full list of indicators with their respective baseline and latest available year are presented in Annex 3.A1.

Using the same method applied to the individual indicators in each dimension, the 12 composite indices can be aggregated into a single well-being index by state (see Annex 3.A1 for details on the method). The resulting index is the mean of the indices in the 12 dimensions (with equal weights) discounted by a factor ("penalty") that measures the variability among dimensions (the higher the variability among dimensions scores, the higher the penalty). With this choice of aggregating function, Baja California Sur, Nuevo Leon and Colima rank in the top three positions at the latest available year. Relatively better performances in the accessibility to services in Nuevo Leon and in education in Veracruz drive the improvement in the ranking position in these two states (Table 3.3). Tamaulipas and Chiapas are the states with the most and the least balanced outcomes among well-being dimensions (smallest and largest penalty), respectively (Table 3.3).

Table 3.3. **Well-being ranking in Mexican states, last and first available years**

State	Last year	First year	Change in the ranking over time	Penalty coefficient at the last year
Baja California Sur	1	1	No change	0.45
Nuevo Leon	2	5	+	0.74
Colima	3	3	No change	0.44
Sonora	4	2	–	0.37
Sinaloa	5	6	+	0.14
Coahuila	6	4	–	0.79
Tamaulipas	7	7	No change	0.10
Nayarit	8	10	+	0.43
Jalisco	9	8	–	0.44
Queretaro	10	11	+	0.50
Aguascalientes	11	12	+	0.83
Chihuahua	12	13	+	0.77
Baja California	13	9	–	1.01
Durango	14	14	No change	0.36
Federal District	15	15	No change	1.31
Zacatecas	16	18	+	0.37
Quintana Roo	17	16	–	0.74
Yucatan	18	17	–	1.55
Michoacan	19	21	+	0.45
Campeche	20	19	–	0.74
San Luis Potosi	21	20	–	0.57
Tabasco	22	22	No change	0.76
Veracruz	23	27	+	0.68
Guanajuato	24	24	No change	0.51
Hidalgo	25	26	+	0.38
State of Mexico	26	23	–	0.66
Tlaxcala	27	28	+	0.97
Morelos	28	25	–	1.20
Puebla	29	29	No change	0.41
Chiapas	30	30	No change	1.92
Oaxaca	31	31	No change	1.11
Guerrero	32	32	No change	0.97

Note: The states are ranked in descending order on the base of the values of the global well-being index (Global AMPI index). Column 3 refers to changes in the ranking from the first to the last year; a "+" (or "–") sign means that the state is in a better (worse) position in the ranking at the last year than in that at the first year; "no change" means that the state occupies the same position in both of the years. It should be noted that the dimensions life satisfaction and social connections are assumed not to change over time for lack of data on the corresponding indicators prior to 2012.

The results on the composite indices and the global well-being index are of course dependent on the choices made on how to aggregate the individual indicators and the dimensions, which should thoroughly tested to understand the robustness of the results to alternative hypothesis (see Annex 3.A1). The above tables are provided as an example of aggregating well-being dimensions and a tool to critically revise the available information for further data improvements. In order to correctly compare well-being scores across states, among dimensions and over time, the individual indicators should be available for all Mexican states for the same reference period. INEGI could also revise the choice of indicators to be included in the composite indices to have an equal number of indicators per dimension, thus strengthening the comparability of the scores among dimensions.

Since the aggregation function in a composite index introduces subjective elements, such as the weighting scheme or the penalty factor, it should undergo a critical scrutiny by INEGI and be placed for open discussion. Other countries' experiences may inform these future reflections. Italy, for example, has published annually since 2013 the "Equitable and Sustainable Well-being (BES)", a dashboard of 134 indicators organised in 12 well-being dimensions. The choice of dimensions and indicators has involved experts, representatives of the private sector and civil society under the guidance of the national statistical office (Istat) and the Italian Council for Economics and Labour (CNEL). For the first time in 2015, the BES report will also include a composite index for each well-being dimension applied to a subset of indicators available at the sub-national level, adopting the same method employed in this chapter and described in Annex 3.A1.

INEGI plans to provide composite indices for each dimension and then gather citizens' appraisals of the dimensions they consider to be the most important for their well-being, with an approach similar to the one used in the OECD Better Life Index. To ensure a large representation of different population groups, such a survey could be run as part of the Digital Inclusion Program launched by the Ministry of Telecommunications and Transport.

Embarking on an inclusive process to measure well-being for policy making

The ultimate aim of improving the statistical information to measure well-being at the sub-national level is to support state and local governments' monitoring of strategic objectives, increase co-ordination among policies and put in place actions to leverage complementarities and manage trade-offs among different policies and different levels of governments. Regions and cities, in Mexico as in other countries, have launched well-being initiatives aimed at improving the effectiveness and coherence of policies for regional development. The state of Morelos, for example, designed its state development plan around a set of clear baselines and targets in different dimensions of well-being over the timeframe of the state government mandate, and carried out extensive consultation on the expected outcomes to identify the strategic actions necessary for their achievement (OECD, 2014b).

A common framework and measures of well-being are critical inputs to improve policy design and implementation, notably by raising social awareness of specific issues. However, to move from measurement to policy making, regional well-being initiatives should consider the following (OECD, 2014a):

- Engaging citizens in the discussion and selection of the most important well-being dimensions and thus adapting the well-being metrics to the different needs and citizens' capacity to bring change, and to the strategic objectives of a region.

Engagement with citizens can be achieved in a variety of ways (e.g. town-hall meetings or meetings organised by non-governmental institutions, community surveys, social network discussion groups, etc.). An open dialogue and the use of data are necessary conditions for mobilising citizens from the very outset.

- Clarifying responsibilities across levels of government, jurisdictions and different groups of stakeholders to design and implement more coherent policies. Well-being calls for a higher level of policy co-ordination and alignment towards a common, "whole-of-government", vision about individuals' and societal progress. Regional well-being initiatives require the involvement of different stakeholders, including the scientific community, institutional stakeholders (business and labour associations, private sector, etc.) to monitor policy consistency and support change, and civil society and citizens to provide inputs and publicly monitor progress. While building a multi-stakeholder governance mechanism is complex and takes time, it can help avoid the risk of initiatives that have only a marginal impact on people's lives.
- Spelling out trade-offs and complementarities among policy objectives measured by well-being indicators. Evaluating policy results can help put in place the changes necessary to improve well-being and understand the distributional impact of policy actions and reforms.

An important aspect of enhancing the effectiveness of regional well-being initiatives is to ensure continuity across political cycles. The sustainability of regional well-being metrics over time depends on the buy-in of the public administration and on effective co-ordination across levels of government. While political leadership is fundamental, and many regional initiatives actually struggle to bring elected officials on board, the buy-in of the public administration (i.e. non-elected civil servants) is indispensable to ensure the continuity of well-being initiatives in case of changes in the political leadership. Limited local capacity for data collection and data use in policy decisions and evaluations are often barriers to the actual participation of local policy makers to well-being strategies that should be taken into account (OECD, 2014b).

In the coming months, INEGI's well-being measurement can support national and local governments' efforts to design a well-being strategy, notably in three ways. First, disseminating the available information together with a narrative on what the well-being outcomes mean in the different states and localities. Second, helping state and local policy makers to select the indicators the most relevant to policy objectives, connect them to regional strategies (for example in the state development plans), and encourage dialogue with municipalities and local stakeholders to setting targets to monitor progress towards the expected results. Finally, INEGI could also provide methodological guidance on the use of information produced locally, connect it with national surveys and support open data in local administrations.

The statistical agenda ahead for measuring sub-national well-being

Mexico has developed a comprehensive system of outcomes indicators to measure people's well-being at the sub-national level and for specific population groups. National household surveys have been expanded to provide information with a representative sample at the state level, including notably the measurement of subjective well-being. Many of the indicators can be used for international comparison as well to monitor differences across states and with the national average. The development of INEGI's

website on state well-being indicators will provide a further impulse to the dissemination and use of these indicators for national and local policy. At the same time, INEGI's portal is a work in progress and improvements for future releases can be identified to fill data gaps, increase its dissemination and make the results more policy relevant.

To improve well-being measurement at the regional and local scale, Mexico, like the other OECD countries, will have to mobilise a wide range of data sources and methods to integrate the various data sources. These include greater reliance on administrative data, use of geographic information systems (GIS), micro data on households and big data. Four priorities have been identified to fill data gaps.

- ***Advancing the measurement of inequalities at different geographical scales.*** The wealth of data on income, poverty and social deprivation provided by INEGI and CONEVAL is extremely useful to monitor the results of policies to fight poverty and increase access to income and services. The recent data on income and multi-dimensional poverty at the state and municipal levels should be continued with regular updates and may serve as an example for other countries wanting to increase the geographical detail of household living standards variables. INEGI may start estimating consumer price levels in the states and municipalities so as to integrate income data in different part of the country and within metropolitan areas to reflect the purchasing power of people living in different places. Data on population in municipalities lacking access to the six social dimensions of the multi-dimensional poverty provided by CONEVAL may help to build relative regional and metropolitan cost of living indices. Finally, income and social segregation within metropolitan areas could be measured to help identify policies better targeted to the actual needs of a metropolitan area.
- ***Developing cross-dimensional indicators.*** In addition to the indicators selected by well-being dimension, INEGI may develop a set of indicators that combine two well-being dimensions. Such a set would help assess the distributional effect of certain dimensions and identify complementarities across well-being dimensions on which to leverage policy intervention. During the consultation led by INEGI with state representatives, education was identified as one of the priorities for cross-dimensional indicators. It would mean, for example, regularly publishing life expectancy by educational attainment (to monitor health and education linkages). The breakdown of indicators by gender was also mentioned as an important future development.
- ***Improving statistical information on environmental performance.*** Despite the importance of monitoring the state of the environment and its impact on people's current and future well-being at the local level, very few measures are available. Like most OECD countries, Mexico lacks nationally and internationally comparable measures of local environment. To improve the measurement of this dimension, geographical and geo-localised information is necessary. INEGI is well positioned to pursue the integration of spatial information with administrative data (e.g. on the use of environmental resources and services) and may contribute to the development of international guidelines on how to produce and treat these data to produce outcome indicators of environmental performance. Further developments will include assessing citizens' satisfaction with the environment and user satisfaction with environmental services (green spaces, air

quality, water, waste treatment, etc.). Energy and transport, in particular within metropolitan areas, represent two additional areas for further statistical work.

- ***Providing sub-national government expenditure by sector.*** Mexico is one of the few OECD countries where the classification of government expenditure by sector (COFOG) is not available at the sub-national level. Although this information would not be included in the system of well-being indicators, it would be of great use to bridge well-being outcomes with policy priorities in Mexican states.

To improve dissemination and use for policy making of the set of well-being indicators, INEGI should consider regularly updating the database in the future, reducing the time-lag for some dimensions (for example education) and accompanying the release of the data with non-technical explanations of how to use and interpret the results.

Countries have been using different approaches to communicate regional well-being indicators to a broad audience. Whether INEGI decides to use composite indices (which convey a unified message but dilute information of the individual indicators) or a dashboard of indicators (which offers more fine-tuned information but could be more difficult to communicate largely) remains an open question at this stage. In any event, the correct dissemination of the well-being database would benefit by expanding the indicators to cover the same period of time to make useful comparison of progress. In case individual indicators will be aggregated in a composite index per dimension, more reflection should be carried out on what indicators include to increase the comparability among well-being dimensions. In fact, when the composite indices are based on a different number of individual indicators per dimension, the variability across states of the index for a dimension with many individual indicators (for example in this report health) is lower than that of a composite index for a dimension with one or few indicators (for example life satisfaction).

Finally, INEGI's engagement to provide methodological guidance to local policy makers in the use of statistical information, including the one produced locally, will increase the impact of well-being measurement in the policy cycle.

Notes

1. Exceptions at the sub-national level are represented by the "Measure of America" reports that compare US states and counties on the base of a transformed human developed index (Measure of America, 2014).
2. It should be noted that in the dataset for the Mexican states, the time reference differs among well-being dimensions, limiting the comparability of the results among them.

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Annex 3.A1. Computing the composite well-being index for Mexican states

The Adjusted Mazziotta-Pareto Index (AMPI) is a composite index for summarising a set of indicators that are assumed to be not linearly substitutable, they have all the same "importance" and no 1-to-1 compensation is envisaged among them. The composite index can be built following the same steps first to aggregate single normalised indicators to obtain a score by dimension and then to aggregate the various well-being dimensions into a single global well-being index.

The individual indicators are normalised using the minimum and maximum values of each indicator for all time periods and for all of the Mexican states, and rescaled in the range from 70 to 130 according to two "goalposts" that represent the minimum and maximum values for all normalised indicators. In this way, by setting the observed national current value to 100, all the values in the Mexican states will lie in the interval [70;130] and values above (below) 100 will represent performance above (below) the national current average. The formula for the normalisation is the following.

Think of a well-being dimension d composed of I_d indicators denoted by letter i, the value of the indicator i for the Mexican state j in year t can be represented by x_{ijt}. The number of indicators depends on the studied well-being dimension d (i.e. $i \in [1,2,\dots I_d]$ and $d \in [1,2,\dots 12]$); since there are 32 states, $j \in [1,2,\dots 32]$; and $t \in [1,2]$, where $t = 1$ and $t = 2$ represent the reference and the last year, respectively.

If higher values of x_{ijt} represent higher well-being in terms of the indicator i (*e.g.* life expectancy), the normalised value of x_{ijt}, denoted as z_{ijt}, can be obtained through the following formula:

$$z_{ijt} = 60 * \frac{x_{ijt} - min_i}{max_i - min_i} + 70 \qquad (1)$$

On the other hand, if higher values of x_{ijt} denote lower well-being as measured by indicator i (*e.g.* obesity rate), the normalised value of x_{ijt} is computed as the complement of Equation 1 with respect to 200 (*i.e.* $z_{ijt} = 200 - 60 * \frac{x_{ijt} - min_i}{max_i - min_i} - 70$). Where min_i and max_i are respectively the minimum and maximum values of the indicator i across states and years (i.e. $min_i = \min_{i \in [1,2,\dots I_d]} x_{ijt}$ and $max_i = \max_{i \in [1,2,\dots I_d]} x_{ijt}$ $\forall\, j \in [1,2,\dots 32]$ *and* $t \in [1,2]$). Then, one simply has to adjust this value in a way that the country normalised score in the latest year is equal to 100.

$$\bar{z}_{ijt} = z_{ijt} - (z_{ic2} - 100) \qquad (2)$$

Where z_{ic2} is the normalised (still not set to 100) value of indicator i for the country in the most recent year. Once all of the indicators of a given dimension d have been normalised and adjusted, one can calculate the AMPI of dimension d for the state j in year t in the following fashion:

$$AMPI_{djt} = M_{djt} - \frac{V_{djt}}{M_{djt}} \tag{3}$$

With M_{djt} and V_{djt} corresponding to the mean and the variance of the normalised and adjusted i indicators of the well-being dimension d (i.e. $M_{djt} = \sum_{i=1}^{I_d} \frac{\bar{z}_{ijt}}{I_d}$ and $V_{djt} = \sum_{i=1}^{I_d} \frac{(\bar{z}_{ijt} - M_{djt})^2}{I_d}$). The second term of Equation 3 is also considered as the penalty due to the within dimension inequality; one interesting feature of this index is that the lack of one indicator cannot be compensated linearly by the increase of another indicator since the inequality across indicators generates an extra penalisation. In other words, more balanced outcomes provide more well-being than the same "quantity" of outcomes unequally distributed.

Once the AMPIs have been estimated for all dimensions, states and years, it is possible to aggregate all of the 12 well-being dimensions into a single global well-being index for each state and year.

$$WB_{jt} = GM_{jt} - \frac{GV_{jt}}{GM_{jt}} \tag{4}$$

where $GM_{jt} = \sum_{d=1}^{12} \frac{AMPI_{djt}}{12}$ and $GV_{jt} = \sum_{d=1}^{12} \frac{(AMPI_{djt} - GM_{jt})^2}{12}$ are the mean and variance of the 12 AMPIs, each AMPI corresponding to one well-being dimensions for a given state and year.

These calculations are performed using a set of 33 indicators that are distributed across 12 well-being dimensions and for two points in time (the baseline and the latest available year). Table 3A.1 shows the indicators by well-being dimension, as well as the baseline and latest year available for each of them.

The results until Equation 3 are shown in the Tables 3.A1.2 (for baseline year) and 3.A1.3 (for latest year), where the values obtained are comparable across the Mexican states and across the well-being dimensions (and to some extent over time). The decomposition of the AMPI (mean and penalty) is also provided, in order to assess the variability within well-being dimensions in each Mexican state. For example, Colima in the base year is below the national performance in "housing" (87.5 versus 89). However, from the base year to the last year, Colima shows an increase of the mean and a reduction of the penalty, so it moves above the country average (101.2 versus 100). Finally, Table 3.A1.4 shows the results of estimating a global index of well-being for a given state and year (see Equation 4); in this scenario Colima has increased its global well-being from 103.8 to 107.4, this result is driven by both an average increase in levels of its 12 well-being dimensions (the global mean moved from 105 to 107.9) and a more balanced performance across dimensions in the most recent year (the global penalty declined from 1.2 to 0.4).

Table 3.A1.1. **Well-being indicators availability**

Dimension	Indicator name	Description of the indicator	First and last available year
Housing	Rooms per person*	Average number of rooms per person in the household	2000-10
	Quality of housing	Percent of houses with ceilings made of durable materials	2000-10
Income	Equivalised household disposable income*	Household disposable income in USD (PPP at constant prices of 2010)	2008-14
	Gini of household disposable income per capita	Gini index on a scale 0 to 1	2008-14
	Poverty rate	Percent of people in multi-dimensional poverty	2010-14
Jobs	Employment rate*	Percent of persons in employment as a share of population aged 15 years and older	2005-14
	Unemployment rate*	Percent of persons in unemployment with respect to the labour force population	2005-14
	Informal employment rate	Percent of persons working in the informal economy as a share of the employed population	2005-14
	Index of critic conditions of the working population	Percent of employees in critical conditions (who work less than 35 hrs/week, work more than 35 hrs/week for a salary lower than the minimum wage, or work more than 48 hrs/week for a salary lower than twice the minimum wage)	2005-14
Accessibility to services	Household broadband access*	Percent of households with broadband connection	2010-14
	Dwellings with access to basic services	Percent of dwellings with piped water, drain lines and electricity	2008-14
	Access to health services	Percent of people with access to public health services	2008-14
Safety	Homicide rate*	Homicides per 100 000 people	2000-13
	Perception of unsafety	Percent of people that feel unsafe in their locality or neighbourhood	2011-14
	Crime rate	Crimes per 100 000 people	2010-13
	Trust in the police	Percent of people that identify and consider that the state police is effective or very effective	2011-14
Education	Educational attainment*	Percent of labour force with at least secondary education	2000-10
	School dropouts	Number of dropouts over total enrolled students (secondary education)	2012-13
Environment	Air pollution*	Average levels of PM2.5 in $\mu g/m^3$	2003-12
	Waste disposal	Percent of solid waste that is disposed in controlled areas	2005-08
Civic engagement and governance	Voter turnout*	Percent of people that vote with respect to the registered people to vote	2000-12
	Civic and political participation	Percent of people that participate in a political party, NGO or volunteer in a philanthropic association	2012
	Perception of absence of corruption in judicial system	Percent of people that perceive judges as not corrupt	2011-14
	Trust in law enforcement	Percent of people that perceive that criminals are always punished	2012-14
Health	Life expectancy at birth*	Average years at birth a person can expect to live	2000-14
	Infant mortality rate	Number of deaths of children younger than 1 year old per 1 000 live births	2000-13
	Maternal mortality rate	Number of maternal deaths per 100 000 live births	2000-13
	Self-reported health	Average self-reported satisfaction with health on a scale 0 to 10 (10 being the best)	2012
	Obesity rate	Percent of obese adults (aged 20 years or older)	2006-12
Life satisfaction	Satisfaction with life	Average self-reported satisfaction with life on a scale 0 to 10 (10 being the best)	2012
Work-life balance	Satisfaction with time for leisure	Average self-reported satisfaction with time available to do what one likes on a scale 0 to 10 (10 being the best)	2012
	Employees working very long hours	Percent of employees that work more than 48 hours per week	2012-14
Community (social connections)	Quality of support network	Percent of people that have at least one friend to rely on in case of need	2012

Notes: From the set of 35 indicators presented in this table, the indicator on extreme poverty, a subset of the indicator on poverty (income dimension), and the indicator on students' assessment in the PISA test, for lack of data in the states of Michoacan, Oaxaca and Sonora, are excluded. The indicators of satisfaction with life (life satisfaction), quality of support network (community or social connections), civic and political participation (civic engagement and governance), self-reported health (health) and satisfaction with time for leisure (work-life balance) are the same in both the baseline and the latest year since they are only available for 2012. Indicators with an "*" are available also for the 362 regions of the OECD countries via the *OECD Regional Well-being Database*: www.oecdregionalwellbeing.org.

Table 3.A1.2. **Well-being by dimension and state in the baseline year**

Baseline year	Housing			Income			Jobs			Accessibility to services			Safety			Education		
	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI
Mexico (country)	89.2	0.2	89.0	100.3	0.0	100.3	103.1	0.5	102.5	84.0	0.9	83.1	103.2	0.6	102.6	93.4	0.0	93.4
Aguascalientes	106.1	1.5	104.7	103.6	0.2	103.4	102.9	0.6	102.3	98.3	1.3	97.0	104.0	1.1	102.9	99.5	0.0	99.5
Baja California	79.8	1.6	78.3	118.4	0.0	118.4	121.9	0.9	121.0	97.5	1.5	96.0	103.4	0.4	103.0	88.8	0.9	87.8
Baja California Sur	89.0	0.0	89.0	117.9	1.0	116.9	117.5	0.4	117.1	95.9	0.4	95.6	112.8	1.1	111.7	99.0	0.1	98.9
Campeche	73.5	0.1	73.5	96.6	0.1	96.4	104.4	2.3	102.1	88.3	0.2	88.1	111.1	0.8	110.3	91.1	0.0	91.1
Chiapas	59.8	0.0	59.8	73.9	0.4	73.4	90.0	9.6	80.4	64.9	0.7	64.2	113.2	0.6	112.6	83.4	1.6	81.8
Chihuahua	89.8	0.8	89.0	101.3	0.7	100.7	119.1	0.7	118.4	91.9	0.7	91.2	92.1	1.9	90.2	85.1	0.0	85.1
Coahuila	102.2	0.1	102.1	112.4	0.2	112.1	107.9	0.9	107.0	97.6	0.9	96.7	110.9	0.1	110.9	89.3	0.9	88.3
Colima	87.7	0.1	87.5	117.2	0.1	117.1	113.1	0.6	112.5	101.5	1.0	100.6	115.4	0.2	115.2	89.5	0.4	89.1
Durango	96.0	0.1	95.9	96.4	0.2	96.2	102.2	0.8	101.4	83.6	0.8	82.8	103.4	1.0	102.5	83.6	0.3	83.3
Federal District	109.0	0.1	108.9	115.0	1.6	113.5	103.8	0.3	103.5	96.6	2.5	94.1	92.8	2.3	90.6	110.8	1.3	109.5
Guanajuato	89.3	1.1	88.2	106.1	1.2	104.8	99.0	0.3	98.7	83.2	1.2	82.1	110.0	0.2	109.9	78.5	0.1	78.4
Guerrero	66.0	0.3	65.7	82.1	0.2	82.0	99.6	5.9	93.7	61.3	1.3	60.0	102.4	0.6	101.8	87.5	0.1	87.4
Hidalgo	86.6	0.3	86.3	94.0	0.6	93.4	96.0	2.3	93.7	73.6	1.3	72.3	109.2	0.5	108.7	84.0	0.7	83.3
Jalisco	101.4	0.9	100.6	111.1	0.0	111.0	110.3	0.5	109.8	91.4	1.3	90.0	109.3	0.1	109.3	104.8	3.2	101.6
Michoacan	83.1	0.1	83.0	96.4	0.7	95.7	99.5	2.6	96.9	72.3	3.9	68.4	104.9	2.6	102.3	88.9	1.6	87.3
Morelos	89.9	0.4	89.5	102.9	0.3	102.6	103.8	1.7	102.1	87.6	1.3	86.3	99.1	0.8	98.4	86.0	0.6	85.3
Nayarit	92.4	0.2	92.3	104.4	0.2	104.3	106.0	2.0	104.0	90.1	0.9	89.2	107.6	0.4	107.1	97.5	0.8	96.7
Nuevo Leon	106.7	0.2	106.5	119.5	0.9	118.6	111.8	0.6	111.2	99.8	0.5	99.3	103.3	0.6	102.7	92.3	3.3	89.0
Oaxaca	66.9	0.0	66.9	86.7	0.8	85.9	99.2	6.8	92.4	58.4	0.9	57.5	108.1	0.8	107.3	80.6	2.6	78.1
Puebla	82.6	0.9	81.7	93.2	1.5	91.7	98.4	3.0	95.5	66.9	2.2	64.7	104.1	1.0	103.0	94.7	1.9	92.7
Queretaro	92.5	0.7	91.8	105.5	0.2	105.2	107.0	0.1	107.0	92.1	0.6	91.5	115.8	0.1	115.8	92.7	0.0	92.7
Quintana Roo	83.4	1.5	81.9	110.1	0.5	109.7	121.9	1.9	120.0	94.8	1.8	93.0	100.4	0.7	99.6	96.6	0.0	96.6
San Luis Potosi	90.5	0.3	90.1	95.1	0.1	95.0	102.3	2.0	100.3	79.9	0.1	79.8	105.2	0.2	105.0	94.8	0.6	94.2
Sinaloa	98.2	1.3	96.9	107.9	0.0	107.9	109.9	0.6	109.3	90.8	0.2	90.5	103.4	0.5	102.9	100.9	0.1	100.8
Sonora	92.5	0.1	92.4	114.3	0.1	114.3	111.1	0.3	110.8	96.8	0.1	96.7	106.3	0.7	105.6	92.4	0.3	92.1
State of Mexico	93.0	1.0	92.0	110.9	1.4	109.5	97.2	0.1	97.1	84.0	1.8	82.1	91.7	2.6	89.1	93.8	0.0	93.8
Tabasco	70.4	0.4	69.9	90.1	0.0	90.1	97.3	2.0	95.3	85.3	0.7	84.6	100.4	2.0	98.5	94.5	0.5	94.0
Tamaulipas	92.9	0.0	92.9	106.5	0.0	106.5	108.2	0.3	107.9	94.0	0.3	93.7	105.8	0.5	105.3	95.9	0.0	95.8
Tlaxcala	91.3	2.2	89.1	100.7	4.1	96.6	92.6	0.9	91.7	80.5	4.1	76.4	108.4	1.2	107.2	93.0	0.2	92.8
Veracruz	75.7	0.1	75.6	94.3	0.4	93.9	96.4	3.3	93.0	71.6	0.2	71.4	107.5	1.7	105.8	85.9	0.8	85.1
Yucatan	87.6	1.0	86.6	101.6	0.1	101.5	104.6	2.5	102.1	84.8	0.1	84.7	116.7	0.9	115.7	91.7	0.8	90.9
Zacatecas	96.4	0.4	96.1	91.9	0.3	91.7	99.6	2.4	97.1	85.0	1.3	83.8	108.3	0.4	107.9	90.5	2.5	88.0

Table 3.A1.2. **Well-being by dimension and state in the baseline year** (*cont.*)

Baseline year	Environment			Civic engagement and governance			Health			Life satisfaction			Work-life balance			Community (social connections)		
	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI
Mexico (country)	97.1	0.0	97.1	98.3	0.1	98.1	88.8	1.7	87.1	100.0	0.0	100.0	99.3	0.0	99.3	100.0	0.0	100.0
Aguascalientes	109.9	0.9	109.0	99.5	0.9	98.7	96.3	1.4	94.9	91.1	0.0	91.1	82.5	0.2	82.3	111.3	0.0	111.3
Baja California	113.0	0.2	112.8	90.1	0.2	89.9	89.1	1.7	87.4	105.8	0.0	105.8	112.9	0.1	112.7	116.7	0.0	116.7
Baja California Sur	109.9	0.1	109.8	104.1	0.3	103.8	104.6	3.1	101.6	108.4	0.0	108.4	117.3	0.0	117.3	127.9	0.0	127.9
Campeche	91.7	2.0	89.7	113.8	0.7	113.1	88.1	0.1	88.0	101.6	0.0	101.6	107.2	1.0	106.2	84.3	0.0	84.3
Chiapas	90.7	2.2	88.5	100.1	4.5	95.6	80.9	7.7	73.2	96.1	0.0	96.1	107.0	0.0	107.0	103.0	0.0	103.0
Chihuahua	107.8	0.0	1078	93.8	1.4	92.4	89.9	3.6	86.3	100.2	0.0	100.2	126.4	0.6	125.8	104.7	0.0	104.7
Coahuila	99.2	0.1	99.1	100.4	0.6	99.8	99.8	0.4	99.4	129.5	0.0	129.5	111.1	0.4	110.8	94.4	0.0	94.4
Colima	94.0	0.2	93.8	110.7	0.7	110.0	95.3	0.4	94.9	104.6	0.0	104.6	110.8	0.8	110.0	125.3	0.0	125.3
Durango	106.1	0.0	106.0	97.1	0.5	96.6	93.4	0.8	92.5	99.2	0.0	99.2	112.1	0.1	112.0	109.0	0.0	109.0
Federal District	103.2	2.7	100.5	88.0	3.6	84.4	93.0	1.1	91.8	84.1	0.0	84.1	84.2	0.0	84.2	108.3	0.0	108.3
Guanajuato	91.1	0.8	90.3	93.9	2.8	91.1	87.6	0.7	86.9	98.4	0.0	98.4	85.8	0.1	85.8	90.3	0.0	90.3
Guerrero	92.2	0.6	91.6	95.3	1.9	93.4	75.3	7.9	67.4	69.5	0.0	69.5	82.0	3.9	78.2	95.7	0.0	95.7
Hidalgo	80.5	0.8	79.7	108.9	1.2	107.7	89.6	4.0	85.6	100.7	0.0	100.7	88.9	0.2	88.7	95.0	0.0	95.0
Jalisco	101.4	0.3	101.1	99.2	0.8	98.4	96.6	1.1	95.5	102.5	0.0	102.5	110.3	1.4	108.9	86.3	0.0	86.3
Michoacan	84.9	0.3	84.6	101.6	2.2	99.4	89.0	1.3	87.6	99.4	0.0	99.4	109.8	0.3	109.6	111.3	0.0	111.3
Morelos	66.3	0.6	65.7	90.1	1.0	89.1	92.5	1.5	91.0	83.6	0.0	83.6	94.5	0.0	94.5	113.3	0.0	113.3
Nayarit	98.1	1.4	96.7	112.9	0.9	112.0	88.1	0.4	87.7	107.3	0.0	107.3	115.9	0.6	115.3	95.0	0.0	95.0
Nuevo Leon	107.1	0.9	106.2	96.7	1.1	95.7	103.5	1.8	101.7	116.2	0.0	116.2	108.7	0.1	108.6	90.2	0.0	90.2
Oaxaca	82.9	6.4	76.5	99.9	2.3	97.6	74.9	9.0	66.0	84.3	0.0	84.3	88.2	0.6	87.6	102.2	0.0	102.2
Puebla	98.6	0.2	98.5	88.2	0.7	87.6	82.8	6.2	76.6	90.3	0.0	90.3	89.0	0.2	88.8	89.1	0.0	89.1
Queretaro	94.0	1.1	92.9	104.0	0.6	103.4	90.0	4.1	85.8	113.1	0.0	113.1	92.9	0.3	92.6	115.0	0.0	115.0
Quintana Roo	105.3	0.8	104.5	100.2	0.4	99.8	82.6	2.7	79.9	99.3	0.0	99.3	96.8	0.0	96.8	80.6	0.0	80.6
San Luis Potosi	91.5	0.0	91.5	111.9	0.5	111.4	88.3	1.9	86.4	88.1	0.0	88.1	104.2	0.5	103.7	79.5	0.0	79.5
Sinaloa	108.7	0.0	108.6	96.8	0.5	96.4	101.8	1.4	100.4	107.3	0.0	107.3	111.9	0.2	111.7	107.7	0.0	107.7
Sonora	99.5	1.8	97.7	106.0	0.6	105.4	96.2	2.3	93.8	115.6	0.0	115.6	117.8	0.1	117.7	113.9	0.0	113.9
State of Mexico	91.0	0.2	90.8	91.3	1.6	89.7	86.9	3.9	83.0	102.4	0.0	102.4	85.8	1.0	84.7	91.0	0.0	91.0
Tabasco	89.9	1.2	88.8	99.8	0.2	99.6	87.1	0.3	86.8	116.1	0.0	116.1	90.3	2.6	87.7	105.9	0.0	105.9
Tamaulipas	94.9	0.3	94.5	107.1	0.2	106.9	91.9	1.0	91.0	110.6	0.0	110.6	111.5	0.2	111.3	107.9	0.0	107.9
Tlaxcala	105.0	0.4	104.6	91.5	0.7	90.9	87.5	3.7	83.8	79.1	0.0	79.1	77.4	2.1	75.3	88.5	0.0	88.5
Veracruz	89.3	1.0	88.3	100.2	0.2	100.0	81.4	3.3	78.1	92.7	0.0	92.7	100.6	0.1	100.5	116.2	0.0	116.2
Yucatan	104.7	1.0	103.7	115.0	1.4	113.6	91.7	1.6	90.1	106.4	0.0	106.4	96.8	0.1	96.8	67.9	0.0	67.9
Zacatecas	93.4	2.2	91.1	107.7	1.8	105.9	86.6	0.6	86.0	104.6	0.0	104.6	102.0	0.2	101.8	92.0	0.0	92.0

Table 3.A1.3. **Well-being by dimension and state in the latest year**

Latest year	Housing			Income			Jobs			Accessibility to services			Safety			Education		
	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI
Mexico (country)	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0
Aguascalientes	114.6	0.2	114.4	108.6	0.0	108.6	102.8	0.9	101.9	108.9	0.1	108.7	115.9	0.1	115.8	103.2	0.0	103.2
Baja California	95.8	2.1	93.7	120.2	0.1	120.0	107.7	1.3	106.4	107.5	0.9	106.6	96.3	0.3	96.1	90.9	1.8	89.0
Baja California Sur	101.4	0.0	101.4	115.9	0.0	115.9	111.9	0.7	111.2	106.8	0.1	106.7	111.6	0.1	111.5	106.8	0.1	106.8
Campeche	85.6	0.0	85.5	103.1	0.0	103.1	103.8	0.8	103.0	98.3	0.5	97.8	108.9	0.1	108.8	96.5	0.1	96.4
Chiapas	69.7	0.3	69.4	79.7	1.5	78.2	85.4	4.5	80.8	81.5	1.5	80.0	109.3	0.4	108.9	82.8	0.1	82.8
Chihuahua	101.5	2.0	99.5	109.4	0.5	108.8	113.8	0.9	112.9	107.8	0.1	107.7	95.5	4.3	91.2	91.2	0.4	90.8
Coahuila	109.7	0.2	109.5	109.3	0.4	108.9	109.2	1.3	107.9	105.1	0.2	104.9	106.4	0.7	105.7	92.7	2.1	90.6
Colima	101.2	0.0	101.2	112.6	0.1	112.5	108.6	0.2	108.4	111.9	0.1	111.8	108.7	1.5	107.3	104.9	0.1	104.8
Durango	101.8	0.2	101.6	105.4	1.4	104.0	95.7	0.4	95.4	100.6	0.1	100.4	104.8	0.8	104.0	88.8	0.5	88.3
Federal District	118.0	0.0	117.9	117.2	1.9	115.4	98.7	1.4	97.3	112.0	1.0	111.0	91.5	1.4	90.1	114.5	1.2	113.3
Guanajuato	101.9	0.4	101.5	104.4	1.3	103.1	100.3	0.0	100.3	101.0	0.4	100.6	105.8	0.7	105.1	88.2	0.1	88.1
Guerrero	76.7	0.1	76.6	89.5	1.4	88.1	100.3	5.5	94.8	81.9	2.6	79.3	92.6	4.6	87.9	90.7	0.0	90.7
Hidalgo	101.4	0.0	101.4	94.1	0.2	94.0	96.2	1.0	95.2	95.6	0.2	95.4	107.9	0.3	107.6	88.7	0.1	88.7
Jalisco	109.5	0.2	109.3	110.9	0.0	110.9	104.9	0.2	104.7	106.5	0.3	106.2	105.1	0.8	104.3	117.3	2.6	114.7
Michoacan	95.8	0.0	95.8	97.5	2.4	95.1	100.4	1.7	98.7	90.9	0.1	90.8	103.5	0.5	102.9	95.3	1.2	94.1
Morelos	103.3	0.0	103.3	99.9	0.9	99.0	100.7	0.6	100.1	102.1	0.1	102.0	92.3	0.6	91.7	89.9	1.4	88.5
Nayarit	103.8	0.0	103.8	105.8	0.2	105.5	98.8	0.5	98.3	103.6	0.0	103.6	111.5	0.6	110.9	117.0	2.5	114.6
Nuevo Leon	114.1	0.0	114.1	123.5	0.1	123.5	109.3	1.6	107.7	114.4	0.6	113.8	111.4	0.8	110.6	98.5	2.0	96.5
Oaxaca	79.1	0.1	79.0	84.6	0.8	83.8	96.9	3.8	93.0	80.7	1.9	78.7	108.5	0.3	108.2	88.4	0.5	87.9
Puebla	94.8	0.2	94.6	79.8	0.2	79.6	96.4	1.2	95.1	92.6	0.1	92.4	104.5	0.2	104.3	101.0	1.1	99.9
Queretaro	106.9	0.1	106.8	109.3	0.1	109.2	101.0	1.9	99.1	102.3	0.1	102.2	112.3	0.1	112.2	100.4	0.0	100.4
Quintana Roo	97.0	1.5	95.5	107.6	0.1	107.5	110.5	0.3	110.2	107.4	0.4	107.0	102.2	0.2	102.0	110.3	0.2	110.0
San Luis Potosi	101.9	0.0	101.9	99.3	0.6	98.7	103.7	0.6	103.1	96.9	0.9	96.0	104.8	0.1	104.7	101.4	0.3	101.0
Sinaloa	108.1	0.5	107.6	106.5	0.0	106.5	101.0	0.6	100.4	103.7	0.0	103.7	104.0	2.0	102.0	114.4	0.1	114.3
Sonora	102.2	0.3	101.9	115.0	0.1	114.9	109.9	0.5	109.5	109.4	0.1	109.2	104.4	0.3	104.1	100.2	0.6	99.6
State of Mexico	104.6	0.2	104.4	103.1	0.8	102.3	94.4	0.5	93.9	101.0	0.1	100.9	78.4	2.6	75.8	97.1	0.3	96.8
Tabasco	81.4	1.0	80.4	102.6	1.1	101.5	92.4	0.6	91.9	94.1	0.4	93.7	95.8	1.5	94.2	101.1	0.0	101.1
Tamaulipas	103.7	0.0	103.7	107.2	0.1	107.2	104.0	0.4	103.6	104.1	0.0	104.1	105.0	0.6	104.3	102.6	0.1	102.5
Tlaxcala	104.5	1.0	103.5	102.1	5.1	97.0	90.9	0.7	90.2	99.9	0.7	99.2	107.8	0.1	107.6	97.8	0.0	97.8
Veracruz	87.3	0.7	86.7	92.7	0.8	91.9	94.5	1.3	93.2	88.7	0.2	88.5	104.1	0.3	103.8	104.4	1.3	103.0
Yucatan	102.8	1.0	101.8	99.8	0.0	99.7	107.1	1.7	105.4	98.6	0.2	98.4	119.6	0.2	119.4	98.5	0.0	98.5
Zacatecas	103.7	0.1	103.7	93.4	0.2	93.2	94.4	0.4	94.0	99.1	0.4	98.7	109.2	1.3	107.9	95.8	1.1	94.7

Table 3.A1.3. **Well-being by dimension and state in the latest year** (*cont.*)

Latest year	Environment			Civic engagement and governance			Health			Life satisfaction			Work-life balance			Community (social connections)		
	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI	Mean	Penalty	AMPI
Mexico (country)	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	100.0
Aguascalientes	112.9	0.4	112.5	99.8	1.6	98.2	105.6	0.2	105.4	91.1	0.0	91.1	83.5	0.1	83.5	111.3	0.0	111.3
Baja California	114.3	0.1	114.3	92.3	1.6	90.6	93.4	0.7	92.7	105.8	0.0	105.8	108.4	0.7	107.7	116.7	0.0	116.7
Baja California Sur	110.7	0.1	110.6	105.2	1.3	103.9	105.1	4.6	100.5	108.4	0.0	108.4	113.3	0.3	113.0	127.9	0.0	127.9
Campeche	102.1	2.5	99.7	113.8	0.6	113.2	91.3	2.0	89.2	101.6	0.0	101.6	106.3	1.1	105.2	84.3	0.0	84.3
Chiapas	94.0	3.2	90.8	114.8	2.7	112.1	95.4	2.0	93.4	96.1	0.0	96.1	107.1	0.0	107.1	103.0	0.0	103.0
Chihuahua	111.2	0.0	111.1	99.6	2.0	97.6	95.1	2.5	92.6	100.2	0.0	100.2	119.9	0.0	119.9	104.7	0.0	104.7
Coahuila	105.2	0.1	105.2	104.5	0.5	104.0	104.9	0.8	104.1	129.5	0.0	129.5	113.5	0.1	113.4	94.4	0.0	94.4
Colima	97.6	0.6	97.0	109.1	0.5	108.6	102.8	0.7	102.1	104.6	0.0	104.6	111.6	0.6	111.0	125.3	0.0	125.3
Durango	107.6	0.0	107.6	108.8	1.6	107.2	101.7	0.2	101.5	99.2	0.0	99.2	111.8	0.2	111.6	109.0	0.0	109.0
Federal District	105.5	1.9	103.6	88.3	1.7	86.5	101.7	0.4	101.3	84.1	0.0	84.1	88.4	0.2	88.1	108.3	0.0	108.3
Guanajuato	95.4	0.5	95.0	89.5	2.2	87.2	100.9	0.2	100.7	98.4	0.0	98.4	82.6	0.4	82.3	90.3	0.0	90.3
Guerrero	93.3	0.7	92.7	103.6	0.7	102.9	90.7	1.4	89.3	69.5	0.0	69.5	80.0	3.1	76.9	95.7	0.0	95.7
Hidalgo	85.3	1.0	84.3	102.8	2.6	100.2	98.9	0.5	98.4	100.7	0.0	100.7	90.4	0.4	90.0	95.0	0.0	95.0
Jalisco	103.3	0.2	103.1	100.7	0.1	100.6	106.1	0.3	105.9	102.5	0.0	102.5	111.9	1.7	110.2	86.3	0.0	86.3
Michoacan	88.8	0.3	88.5	100.3	3.3	97.0	100.5	0.0	100.5	99.4	0.0	99.4	110.9	0.4	110.6	111.3	0.0	111.3
Morelos	70.4	0.6	69.8	90.6	0.9	89.7	100.2	0.6	99.6	83.6	0.0	83.6	95.4	0.0	95.4	113.3	0.0	113.3
Nayarit	103.3	1.0	102.3	117.8	1.0	116.7	99.8	0.2	99.5	107.3	0.0	107.3	115.7	0.6	115.1	95.0	0.0	95.0
Nuevo Leon	111.8	0.4	111.4	99.9	2.2	97.7	109.5	2.3	107.2	116.2	0.0	116.2	111.1	0.3	110.8	90.2	0.0	90.2
Oaxaca	83.3	6.6	76.7	104.1	1.1	103.0	84.8	0.8	84.0	84.3	0.0	84.3	88.0	0.6	87.5	102.2	0.0	102.2
Puebla	101.3	0.4	100.9	91.4	0.4	90.9	95.8	0.6	95.1	90.3	0.0	90.3	91.3	0.4	90.8	89.1	0.0	89.1
Queretaro	96.1	0.6	95.4	103.8	0.2	103.6	105.7	0.5	105.2	113.1	0.0	113.1	89.9	0.0	89.9	115.0	0.0	115.0
Quintana Roo	111.7	0.5	111.2	96.6	0.7	96.0	96.4	0.6	95.8	99.3	0.0	99.3	94.7	0.1	94.6	80.6	0.0	80.6
San Luis Potosi	98.5	0.2	98.3	107.2	0.3	106.9	103.3	0.2	103.1	88.1	0.0	88.1	105.1	0.6	104.4	79.5	0.0	79.5
Sinaloa	108.9	0.0	108.9	104.1	1.8	102.3	107.2	0.6	106.6	107.3	0.0	107.3	112.0	0.2	111.8	107.7	0.0	107.7
Sonora	100.7	1.6	99.1	99.6	0.8	98.9	104.3	1.3	103.1	115.6	0.0	115.6	114.4	0.4	114.0	113.9	0.0	113.9
State of Mexico	91.8	0.0	91.8	92.2	0.8	91.4	103.4	0.4	102.9	102.4	0.0	102.4	88.7	0.5	88.3	91.0	0.0	91.0
Tabasco	94.1	2.2	91.9	103.2	1.0	102.2	93.8	1.8	92.0	116.1	0.0	116.1	94.8	1.2	93.6	105.9	0.0	105.9
Tamaulipas	107.1	0.2	106.9	107.5	1.2	106.3	100.7	0.6	100.0	110.6	0.0	110.6	111.9	0.1	111.8	107.9	0.0	107.9
Tlaxcala	105.8	0.4	105.4	95.7	0.2	95.5	102.5	0.3	102.2	79.1	0.0	79.1	78.1	2.3	75.8	88.5	0.0	88.5
Veracruz	91.0	1.0	90.0	99.8	0.4	99.3	93.4	0.8	92.6	92.7	0.0	92.7	102.2	0.0	102.2	116.2	0.0	116.2
Yucatan	107.0	1.6	105.5	119.2	1.3	117.8	96.2	3.0	93.2	106.4	0.0	106.4	97.4	0.0	97.4	67.9	0.0	67.9
Zacatecas	101.0	0.9	100.1	115.0	1.8	113.2	102.3	0.1	102.2	104.6	0.0	104.6	101.6	0.3	101.3	92.0	0.0	92.0

Table 3.A1.4. **Global well-being index by state and year**

State	Baseline year			Latest year		
	Global mean	Global penalty	Global well-being	Global mean	Global penalty	Global well-being
Mexico (country)	96.0	0.4	95.7	100.0	0.0	100.0
Aguascalientes	99.8	0.6	99.2	104.5	0.8	103.7
Baja California	102.5	1.8	100.7	103.3	1.0	102.3
Baja California Sur	108.1	1.0	107.1	109.8	0.4	109.4
Campeche	95.4	1.3	94.1	99.0	0.7	98.2
Chiapas	86.3	3.1	83.3	91.9	1.9	90.0
Chihuahua	99.3	1.5	97.8	103.1	0.8	102.3
Coahuila	104.2	1.0	103.2	106.5	0.8	105.7
Colima	105.0	1.2	103.8	107.9	0.4	107.4
Durango	98.1	0.8	97.3	102.5	0.4	102.1
Federal District	97.8	1.1	96.7	101.4	1.3	100.1
Guanajuato	92.1	0.9	91.2	96.0	0.5	95.5
Guerrero	82.2	2.1	80.1	87.0	1.0	86.0
Hidalgo	91.3	1.2	90.1	95.9	0.4	95.5
Jalisco	101.2	0.6	100.7	104.9	0.4	104.4
Michoacan	93.8	1.4	92.4	98.7	0.4	98.3
Morelos	91.8	1.4	90.4	94.7	1.2	93.5
Nayarit	100.6	0.7	99.9	106.1	0.4	105.6
Nuevo Leon	103.8	0.8	103.0	108.3	0.7	107.6
Oaxaca	83.5	2.5	81.0	89.0	1.1	87.9
Puebla	88.3	1.1	87.3	93.6	0.4	93.2
Queretaro	100.6	1.0	99.6	104.3	0.5	103.8
Quintana Roo	96.8	1.4	95.5	100.8	0.7	100.1
San Luis Potosi	93.7	1.0	92.8	98.8	0.6	98.2
Sinaloa	103.4	0.4	103.0	106.6	0.1	106.4
Sonora	104.7	0.8	103.8	107.0	0.4	106.6
State of Mexico	92.1	0.6	91.5	95.2	0.7	94.5
Tabasco	93.1	1.3	91.8	97.0	0.8	96.3
Tamaulipas	102.0	0.5	101.5	105.8	0.1	105.7
Tlaxcala	89.7	1.0	88.6	95.2	1.0	94.2
Veracruz	91.7	1.7	90.0	96.7	0.7	96.0
Yucatan	96.7	1.7	94.9	100.9	1.5	99.4
Zacatecas	95.5	0.6	94.9	100.5	0.4	100.1

Sensitivity analysis

A sensitivity analysis was performed to assess the robustness of rankings to the inclusion or exclusion of individual indicators in a given dimension. In Table 3.A1.5, a comparison among the AMPI and two traditional methods (arithmetic mean of standardised values, and geometric mean of indexed values) is presented for the latest available year. The table reports the mean and standard deviation of the shifts in the ranking when an individual indicator is excluded.

The results show the AMPI provides a middle result compared to the other two methods. In particular, the mean standard deviation is less than the geometric mean of indexed values (0.95 versus 1.55), because indexation gives weights proportional to the variability, and then some indicators are considerably more influential than others. On the contrary, the AMPI tends to assign equal weight or importance to each indicator and it is less sensitive to the number of individual indicators in a given dimension.

Table 3.A1.5. **Results of sensitivity analysis**

Dimension	Number of individual indicators	Arithmetic mean of standardised values		Geometric mean of indexed values		AMPI	
		Mean	Std	Mean	Std	Mean	Std
Housing	2	4.22	0.09	4.06	1.81	4.22	0.59
Income	3	2.33	0.36	0.98	0.31	2.06	0.26
Jobs	4	3.30	0.46	3.25	1.67	3.13	1.60
Accessibility to Services	3	2.92	0.43	2.10	1.61	2.48	0.54
Safety	4	2.91	0.65	2.98	2.27	2.95	1.10
Education	3	3.77	0.56	3.77	2.50	3.94	1.19
Environment	2	5.81	0.56	5.69	0.13	5.81	1.69
Civic Engagement and Governance	4	2.88	0.47	2.08	0.89	3.00	0.72
Health	5	2.33	0.31	2.29	1.84	2.65	1.20
Life Satisfaction	1	-	-	-	-	-	-
Work-Life Balance	2	3.88	0.25	3.88	2.44	3.97	0.59
Community (Social Connections)	1	-	-	-	-	-	-
Mean		**3.44**	**0.41**	**3.11**	**1.55**	**3.42**	**0.95**