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- Many indicators are used to measure national quality of life and human development. These can be divided into single indicators and component sets. Some emphasize 'objective' and some 'subjective' measures.
- We review these approaches and describe public domain and free data that can be used to measure quality of life.

Measuring quality of life using free and public domain data

Gene Shackman, Ya-Lin Liu and Xun Wang

A worthy goal of any government is to improve the quality of life of its citizens. But how is the government to know whether the quality of life has improved or what the quality of life is? One common approach is to use quality of life indicators, usually including measures of at least some of these dimensions: economic well being, health, literacy, environmental quality, freedom, social participation and self- perceived well being or satisfaction (André and Bitondo, 2001).

Quality of life indicators allow governments to evaluate how well they are doing compared with, for example, their development goals or the quality of life in other countries. The indicators may also be used by outside observers or researchers to evaluate countries' performance. Indicators could also be used by teachers and students to help understand the relationships among different aspects of society. For example, where there is higher quality of life, there is higher GDP per capita and literacy, but higher quality of life does not always equal higher satisfaction (Shackman, Liu and Wang, 2005).

In this *Update*, we review comparative international approaches to measuring quality of life. Some indicators are 'objective' or countable, such as GDP per capita, infant mortality rate, and literacy rate. Alternative indicators focus more on individual perceptions of well being or satisfaction. Some quality of life approaches use mainly objective indicators, while others focus

more on the subjective side.

In the next section, we review these approaches. Many of the indicators are available from governmental agencies or non-governmental organizations (NGOs) and in the last section, we describe some of them.

'Objective' approaches

According to Sharpe and Smith (2005), the best known composite quality of life scale is the United Nations Development Program's Human Development Index, HDI (UNDP, 2004). This index is a single value measuring health and longevity, knowledge (literacy and school enrollment) and standards of living (GDP per capita). Countries are rated on how well they are doing on each component compared to the range of possible values for that component. The HDI value averages the ratings of the three components. To calculate an individual country's comparative rating, the UNDP sets minimum and maximum values for the components. However, the minima and maxima and the country ratings themselves can vary greatly from year to year, even if conditions do not change much. In addition, the HDI is a comparative rating, so that a country's HDI score depends on the achievements (or failures) of other countries. Thus, the score cannot be used to chart the progress from year to year of any one country, compared only to its own previous achievements.

Other international composite scales also

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described in Sharpe and Smith's (2005) report include Prescott-Allen's (2001) Index of the Wellbeing of Nations and Estes' (1997) Index of Social Progress. All these scales correlate with each other at a level of 0.89 or above and so seem to be measuring similar qualities (Shackman, Liu and Wang, 2005).

A composite scale is useful as an overall indicator. However, a single composite may sometimes be problematic, as different scales use different indicators or give different weights to indicators, and the construction of the composite scale may not always be clearly explained (Giovannini, 2005). Also, single scales may oversimplify the concept and do not present information about its components (André and Bitando, 2001). Finally, many quality of life scales also correlate fairly highly with income per capita (McGillivray, 2004) and thus may not add much useful information to this simpler economic indicator.

Thus, a *set* of key indicators may also be useful, because they cover a range of topics and avoid the need for combining or weighting individual components (Giovannini, 2005). Several of the organizations measuring quality of life described above (e.g., Estes, 1997; UNDP, 2004) also use sets of indicators. In fact, this is the primary approach of the UNDP. The sets used by the UNDP and Estes include measures of health, education, economic well being, environment and technology, and tend to focus on 'objective' measures. The indicators are aggregate level measures, using the country as the unit of analysis. For example, literacy is defined as the percent of the country's population that can read.

Alternatives

Alternatives to these major approaches include attempting to measure the non-economic aspects of the quality of life (McGillivray, 2004); well being as a hierarchy of needs (Clarke, 2005); and 'Gross National Happiness' (GPI Atlantic, undated). This last approach "links the economy with social and environmental variables to create a more comprehensive and accurate measurement tool" (GPI Atlantic, undated).

Researchers have also tried to measure the more 'subjective' aspects of quality

of life (Camfield, 2005; Veenhoven, 2004), developed subjective quality of life scales (e.g., Diener, 1995), and studied the relationship between subjective and objective aspects (Gasper, 2004).

Subjective quality of life has been variously defined, for example:

This dimension covers perceptions, evaluations and appreciation of life and living conditions by the individual citizens. Examples are measures of satisfaction or happiness. (Noll, 2005)

The outcome of the gap between people's goals and perceived resources, in the context of their environment, culture, values, and experiences. (Camfield, 2005)

Although Gasper (2004) asserts that subjective well being does not correlate well with 'objective' measures, a recently developed scale of life satisfaction, the quality of life scale (Economist Intelligence Unit, 2005) correlates highly (.77 and above) with the 'objective' measures of GDP per capita, infant mortality rate and literacy. On the other hand, another satisfaction with life scale (Veenhoven, 2004) correlates 0.4 to 0.5 with the major scales, but 0.74 with the Economist Intelligence Unit's (2005) scale. Thus, as Veenhoven (2004) indicates, it may be that 'subjective well being' is not a unitary concept, but rather requires different indicators for different aspects.

Subjective quality of life scales are also constructed somewhat differently than are the 'objective' scales. These scales are, as the label suggests, from the individual's own point of view. For example, Veenhoven (2004) uses individual's perceptions of their life satisfaction and then presents average responses for each country.

Public domain data for measuring quality of life

Data for a number of the variables used in quality of life scales can be obtained from public domain sources. They are available for anyone to use without restriction.

The *CIA World Factbook*, <http://www.cia.gov/cia/publications/factbook/index.html>, has data on population, birth rate, infant mortality rate, GDP per capita, internet users, literacy, and phone lines. For most variables, data are presented for only for

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the most recent year available, although the data for literacy includes estimates from the 1980s and earlier. For many variables, data are available for about 200 countries. The World Factbook literacy rates correlate 0.97 with recent UNESCO (2005) literacy rates. Most of the variables from the World Factbook (infant mortality rate, literacy rate, and internet, phones and GDP per capita) correlate 0.7 or more with the major quality of life scales, except literacy and the Economist Intelligence Unit scale, which correlates 0.46.

The Census Bureau's *International Data Base*, <http://www.census.gov/ipc/www/idbnew.html>, contains fairly complete data for about 200 countries for births and deaths per 1,000 and infant mortality for the years 1990 to 2000, with fewer cases available for years prior to 1990. There are also complete population data for 1950 to the present day. Infant mortality rate and births per capita correlate -0.8 or more with the major quality of life scales, except for the Economist Intelligence Unit scale, which correlates -0.7 and -0.57, respectively, with these two indicators.

The Department of Energy has a database on energy consumption, production, prices, GDP, GDP per capita and population for the world, regions and close to 200 countries, from 1980 to 2002/3 at <http://www.eia.doe.gov/emeu/international/>. Energy consumption per capita and GDP per capita correlate 0.6 with each other and 0.45 to 0.8 with the major quality of life scales. The Economist Intelligence Unit scale has the lowest correlation (0.45 with energy consumption per capita) and the highest correlation (0.8 with GDP per capita) of the major scales.

Free non-public domain data for measuring quality of life

There are also additional data sources, not public domain, which include some of the variables mentioned in quality of life research. The Freedom House has country ratings of political freedom and civil rights, at <http://www.freedomhouse.org/ratings/index.htm>. Teams of regional experts evaluate and analyze information from news reports,

Data source	Indicators	Time Frame
US CIA World Factbook	population, birth rate, infant mortality rate, GDP per capita, internet users, literacy, phone lines	Current
US Census Bureau's International Data Base	Population	1950 - current
	Births and deaths per 1,000 infant mortality	1990 - current
US Department of Energy	Energy consumption, production, prices, GDP, GDP per capita, population	1980 - 2003
Freedom House	Ratings of political freedom and civil rights	1972 - 2005
Michael Coppedge and Wolfgang Reinicke	Contestation (political freedom)	1985 and 2000
Food and Agricultural Organization	Undernourishment, and consumption of protein, energy and fats per day	1969/71, 2000 and at roughly 10 year intervals in between

Table 1. Data sources and indicators

academic, nongovernmental or think tank research, individual professional contacts, and visits to the region. Political rights vary from free and fair elections, competitive power, real roles for opposition parties, and minority group participation (at the most free end of the scale) to no rights, repressive regime, civil wars, violence, and warlord rule (least free). Civil liberty varies from freedom of expression, assembly and religion and fair and equitable rule of law (most liberties), to no freedom and justified fear of repression. Freedom, the combination of these two, correlates between 0.5 and 0.72 with the major quality of life scales.

Contestation, also describing political freedom, is available at <http://www.nd.edu/~mcoppedg/crd/datacrd.htm>. The 1985 scales were prepared from ratings by Michael Coppedge and Wolfgang Reinicke, and the 2000 scales were based on ratings from Dr. Coppedge's undergraduates. For the 2000 data, information for the contestation scales was from the US State Department. The 1985 ratings were based on other information (Coppedge and Reinicke, 1990). The contestation scale correlates with Freedom House summary scale 0.89, but correlates between 0.34 and 0.56 with the major quality of life scales.

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The Food and Agricultural Organization (FAO) of the UN has data at http://www.fao.org/faostat/foodsecurity/index_en.htm. These data can be used freely for academic and non commercial purposes and include undernourishment and consumption of protein, energy and fats per day. Prevalence of undernourishment correlates highly with energy consumption per day (-0.92), and fairly well with protein and fats per day (-.77 and -.64, respectively). It correlates at about -0.46 with GDP per capita and literacy rates, and between 0.52 and 0.71 with the major quality of life scales.

Conclusion

Quality of life is a concept that has aspects that are not easily measurable. However, many components can be measured, and data are available on the web, most often for free, to assess them. We have compiled many of these data into a single data set called PD-Plus.xls at <http://gsociology.icaap.org/dataupload.html>, and this can be used to generate reports that are accessible to the public (e.g., Shackman, Liu and Wang, 2005).

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