Health and wellbeing around the world: Evidence from the Gallup World Poll

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ABSTRACT

During 2006, the Gallup Organization conducted a World Poll that used an identical questionnaire for national samples of adults from 132 countries. I analyze the data on life satisfaction (happiness) and on health satisfaction and look at their relationships with national income, age, and life-expectancy. Average happiness is strongly related to per capita national income; each doubling of income is associated with a near one point increase in life satisfaction on a scale from 0 to 10. Unlike most previous findings, the effect holds across the range of international incomes; if anything, it is slightly stronger among rich countries. Conditional on national income, recent economic growth makes people unhappier, improvements in life-expectancy make them happier, but life-expectancy itself has little effect. Age has an internationally inconsistent relationship with happiness. National income moderates the effects of aging on self-reported health, and the decline in health satisfaction and rise in disability with age are much stronger in poor countries than in rich countries. In line with earlier findings, people in much of Eastern Europe and in the countries of the former Soviet Union are particularly unhappy and particularly dissatisfied with their health, and older people in those countries are much less satisfied with their lives and with their health than are younger people. HIV prevalence in Africa has little effect on Africans’ life or health satisfaction; the fraction of Kenyans who are satisfied with their personal health is the same as the fraction of Britons and higher than the fraction of Americans. The US ranks 81st out of 115 countries in the fraction of people who have confidence in their healthcare system, and has a lower score than countries such as India, Iran, Malawi, or Sierra Leone. While the strong relationship between life-satisfaction and income gives some credence to the measures, as do the low levels of life and health satisfaction in Eastern Europe and the countries of the former Soviet Union, the lack of correlations between life and health satisfaction and health measures shows that happiness (or self-reported health) measures cannot be regarded as useful summary indicators of human welfare in international comparisons.

Keywords: Gallup World Poll, Happiness, Life-satisfaction, Health, Income, Aging, HIV, Healthcare.
1. Introduction

In 2006, the Gallup Organization ran a World Poll using samples of people in each of 132 countries; with the exception of Angola, Cuba, and Myanmar, where the samples are urban, the samples are nationally representative of people aged 15 and older. The questionnaire covered many aspects of wellbeing, including an overall measure of life satisfaction, as well as several aspects of health and economic status. Because the survey used the same questionnaire in all countries, it provides an opportunity to make cross-country comparisons while, at the same time, providing enough data to permit within-country disaggregation, for example, by age and sex. No previous poll has provided national samples of so many countries, particularly poor countries, including many in sub-Saharan Africa. Here I focus on the life satisfaction question about life at the present time, measured on an eleven point scale from 0 (“the worst possible life”) to 10 (“the best possible life”), and the health satisfaction question (“are you satisfied or dissatisfied with your personal health?”). I look at how the answers to these questions vary with age and with the objective circumstances of the country, particularly the levels and rates of change of per capita income and life expectancy.

The great promise of self-reported measures of life satisfaction is that they might provide a straightforward and easily-collected measure of individual or national wellbeing that aggregates over the various components of wellbeing, such as economic status, health, family circumstances, and even human and political rights. That such measures do indeed achieve this end, and should be the only measures used to evaluate policy and progress, has been forcefully argued by Layard (2005). Such a position is in sharp contrast to the more widely accepted view, associated with Sen (1999), that human
wellbeing depends on a range of functions and capabilities that enable people to lead a good life, and each of which needs to be directly and objectively measured. There is an empirical as well as a philosophical component to this debate, since we can ask whether reports of life satisfaction, on average if not for each individual, provide a clear-eyed aggregate of the different components of peoples’ capabilities.

Individual life-satisfaction depends on some combination of circumstance and of individual temperament, which provides a “set-point” to which life satisfaction tends to revert, and there is a lively debate about which circumstances are important, and about which—if any—have permanent as opposed to merely transitory effects. It is often argued that income is both relatively unimportant and relatively transitory compared with family circumstances, unemployment, or health, see Easterlin (2003). Note that even if variations in temperament are more important than variations in circumstance at the individual level, the same need not be true of the population. The role of income is of particular interest. Many within-country studies have found only a small effect of income on happiness relative to other life-circumstances such as employment or marital status, see for example Helliwell (2003) or Blanchflower and Oswald (2004). Kahneman et al (2005) argue that even these measures overstate the effects of income. They suggest that more income may do nothing for happiness, and that the observed correlation between life satisfaction and income comes from a “focusing illusion,” induced by the life-satisfaction question, which prompts respondents to compare their incomes with some standard set by their own previous incomes or by the incomes of others. It is therefore possible that, over the long run, increases in income will generate no increase in life-satisfaction. This result is consistent with the micro-level evidence from the German
Socioeconomic Panel by Di Tella et al (2005), who regress life satisfaction on income and on several lags of income, and find that life-satisfaction adapts completely to income within four years. It is only income change that matters, not income itself.

A long-run zero effect of income is also consistent with the famous country-level findings by Easterlin (1974, 1995) that average national happiness does not increase over long time spans, in spite of large increases in per capita income. These within and between country findings point to there being little or no long run relationship between national income and national happiness, so that one might reasonably infer that this would also be so across countries, given that most international income differences are long established. But the evidence does not support this inference. Although the US and Japan may have failed to become happier as they grew richer, poor countries, such as India or Nigeria, are less happy than rich countries, such as the US or Japan, see for example Ingelhart and Klingemann (2000), Graham (2005), Layard (2005), Leigh and Wolfers (2006), or the careful and balanced survey by Diener and Oishi (2000). One argument, due to Veenhoven (1991), is that more income improves happiness only until basic needs are met; beyond the point where there is enough income so that people are no longer hungry, their children do not die from readily preventable diseases, and absolute poverty has been eliminated, income does not matter for happiness. While this story seems plausible, there is a contrary view that it is only after these basic needs have been met that the possibilities for intellectual and cultural development can be fully explored. This is akin to Robbins’ (1938) account of the Brahmin who claimed to be “ten times as capable of happiness as that untouchable over there.”
An important source of previous empirical evidence is the World Values Survey, which covers rich countries, together with a smaller number of poor countries, as well as a group of countries from Eastern Europe and the former Soviet Union. Authors who have worked with these data have tended to conclude that (a) richer countries are happier, (b) the cross-country effect of income on happiness is larger than the within-country effect of income and happiness, and (c) that among the rich countries, there is no relationship between national income and national happiness, see again Ingelhart and Klingemann (2000, Figure 7.2) and Layard (2005, page 32) who writes that for “the Western industrial countries, the richer ones are no happier than the poorer.” Findings (a) and (c) are consistent with the view that, once basic needs are met, life satisfaction does not respond to income, while (b) is a consequence of the comparison between poor countries as a group and rich countries as a group. As we shall see, the results from the World Poll are very different.

2. Life satisfaction and income: evidence from the World Poll

Figure 1 shows a world map of the life-satisfaction measure from the 2006 World Poll data. The numbers for each individual range from 0 to 10, and the shading corresponds to the (sample weighted) averages for the 121 countries used here. The map looks similar to an income plot of the world: North America, Europe, Japan, Australasia, and Saudi Arabia are happy as well as rich, and the really unhappy places on the planet are in sub-Saharan Africa, plus Haiti and Cambodia. The only countries in the bottom twenty according to life-satisfaction and that are relatively well-off in income terms are Georgia
and Armenia. At the other end, there are two relatively poor places in the happiness top twenty, Costa Rica and Venezuela.

Figure 2 summarizes information about the relationship between life satisfaction and national income, and about how that relationship changes with age, or equivalently, how the age profile of average life satisfaction varies across countries. The horizontal axis, for all plots, is per capita GDP in 2003 (the nearest year for which there is complete data in the Penn World Table) measured in purchasing power parity dollars at 2000 prices. Each circle is a country, with diameter proportional to population, and marks average life satisfaction and GDP for that country. Important countries are labeled; most of the countries of sub-Saharan Africa are on the bottom left, India and China are the two large circles near the left, the western European countries appear near the upper right, and the USA is the large country on the top right. There are also seven plotted lines on graph, only six of which are clearly visible. Each of these corresponds to an age group, 15–19, 20–29, 30–39, 40–49, 50–59, 60–69, and 70 plus. For each of these seven groups, and for each country, I calculated the (unconditional) average of life-satisfaction. Each line is a non-parametric regression plot for one age group of its average-life-satisfaction against national per capita GDP (taken to be the same for all age groups in the country.) These lines can be thought of as a disaggregation by age of the average plot represented by the circles.

As with the map in Figure 1, life-satisfaction increases with GDP per head. The slope is steepest among the poorest countries, where income gains are associated with the largest increases in happiness, but it remains positive and substantial even among the rich countries; it is not true that there is some critical level of GDP per capita above which
income has no further effect on happiness. Since this result is different from the earlier findings reviewed in the previous section, I investigate it further.

Figure 3 plots average happiness against the logarithm of per capita income, and this simple transform is enough to make the relationship close to linear. Column 1 of Table 1 shows the regression for the 114 countries for which we have both life-satisfaction and per capita PPP GDP from the Penn World Table. The coefficient is 0.859 with an estimated standard error of 0.051. Using the same sample, the quadratic in column (2) improves the fit only slightly; the $t$-value on the squared term is only 2.2. Note too that the quadratic term has a positive sign, so that the effect of log income on life satisfaction is estimated to increase at higher levels of income per head. Columns 3 and 4 split the sample at $12,000 which is a level that splits the poor and middle-income countries from the rich countries, see Figure 2. Once again, the slope in the upper income countries is higher, although it has a large estimated standard error. If we restrict the sample to the 24 countries whose per capita GDP is above $20,000, the estimated slope is 0.617 with a standard error of 0.649, which is clearly consistent both with a zero slope, and with a slope that is the same as the slope in the poor countries; visual inspection of Figure 3 shows that the latter is the obvious conclusion. The final two columns address the same question in a slightly different way, interacting the term in log income with, first, in column (6), an indicator that per capita income is above $12,000, and then second, in column (7), an indicator that per capita income is above $20,000. In both cases, the interaction term is estimated to be positive, and is significantly different from zero in the final column.
These results support the visual impression in Figure 3, that the logarithmic fit with a constant slope is adequate for all countries, rich or poor, and if there is any evidence for deviation, it is small and in the direction of the slope being higher among the richer countries.

Why are these results so different from those studies that have concluded that, among the rich countries, national income has no effect on national life satisfaction? Figure 4 shows the data that supports these findings, taken from the 1981, 1990, and 1996 waves of the World Values Surveys, with each country marked by its three letter “isocode” as used by the Penn World Table and World Bank. For comparability with the World Poll, I have included only countries that appear in both sources, and I have excluded regions or cities. Even so, Figure 4 reproduces the main features of previous analyses. There is a steep relationship between happiness and income on the left of the graph, which becomes much flatter among the rich countries on the right. To see how this relates to the World Poll data, note four points: (a) apart from South Africa (ZAF) and Korea (KOR), all of the countries at the bottom left are in Eastern Europe or were once part of the Soviet Union, including Moldova, Ukraine, Armenia, Belarus, Russia, Bulgaria, Latvia, Estonia, Azerbaijan, Bosnia and Herzegovina, Macedonia, Romania, Estonia, and Slovakia; (b) if we look at the few long-term poor countries in the sample, Ghana, China, Philippines, Bangladesh, India, Peru, and the Dominican Republic, they all are much happier than the Eastern European countries; (c) as a consequence of (a) and (b), the sharply curved nature of the happiness to income relationship comes, not so much from the poor countries, but from the Eastern European and former Soviet countries, whose unhappiness is almost certainly not primarily due to their low incomes; (d) Figure 4, unlike Figure 3, shows
income on an absolute, rather than a logarithmic scale. Once the transformation is made, the happiness to log income relationship is close to linear except, once again, for the countries of Eastern Europe, see also Leigh and Wolfers (2006).

Figure 5 combines the World Poll and World Values Survey data using a logarithmic scale for income; it is identical to Figure 3 with the WVS data overlaid. The World Poll data are shown in red and correspond to the right hand scale; the World Values Survey data in blue and correspond to the left-hand scale. The World Poll uses an 11 point scale (0 to 10) and the World Values Surveys a 10 point scale (1 to 10.) The most important difference between the two surveys is that all the points at the bottom left of the diagram are red points, mostly from Africa. The World Poll covers many more very poor countries than do the World Values Surveys and the happiness and income data for these countries lie close to the line for middle-income and rich countries alike. Otherwise, the two data sets are more notable for their similarities than their differences. India and China are richer and unhappier in the more recent World Poll; which perhaps comes, not from substance, but from the fact that the World Poll is a national sample whereas the WVS, particularly the earlier rounds, selected Indian and Chinese (and Nigerian) samples largely from literate people in urban areas. At the same time, some of the Eastern European and former Soviet countries, unhappy though they are in 2006, are less unhappy than in the earlier surveys. But there is no broad contradiction between the two surveys, and the World Values Surveys provide no evidence against the finding from the World Poll that, throughout the range of national incomes, higher average incomes are associated with higher levels of average life satisfaction.
It is of course possible that income is standing in for something else, such as relative income, income relative to expectations or to past income (growth), or for other variables correlated with income, of which health is plausibly the most important. Indeed, the international pattern of life-satisfaction in relation to per capita GDP is very similar to the pattern between life-expectancy and income, first documented by Preston (1975).

Table 2 investigates the growth and health stories. Column 1 regresses average life-satisfaction on the logarithm of income in 2003 and the average growth rate of income from 2000 to 2003. Note that this is mechanically equivalent to regressing life satisfaction on the logarithms of income in both 2000 and 2003, or indeed to regressing life satisfaction on the logarithm of income in 2000 and its growth from 2000 to 2003. The addition of growth to the regression does not eliminate the effect of income in levels, so that there is no evidence that the effect of income is spurious, picking up only the correlation between income and its growth rate. It is not true that it is only growth in income that matters, not its level. Second, and more surprisingly, at any given level of income, economic growth is associated with lower reported levels of life-satisfaction, a result that seems inconsistent with almost all of the accounts in the literature, although see Diener, Diener, and Diener (1995) who also find a negative effect of growth on happiness in an international sample of college students, though not in their national samples. This is one of the most puzzling and surprising results in this paper.

Note that growth from 2000 to 2003 is the change in log income divided by three, so that the regression in column 1 can also be interpreted as a levels regression in which log income in 2003 attracts a negative coefficient, and log income in 2000 a positive one, with their sum remaining at 0.860. Essentially these data cannot tell which year’s income
is the most important one, a finding that is confirmed by adding further lags of log income (not shown). Yet in all of these alternative specifications, the sum of the coefficients on the lags remains roughly constant, which is consistent with life-satisfaction responding to the long-term average income, as in a permanent-income model of life satisfaction. Column (2) also shows that the precise period of income growth is not important, and that the model does just as well assigning the negative effects of growth to the three years from 2000 to 2003, or the decade from 1990 to 2000, or some combination of the two. The addition of earlier growth rates does nothing to enhance or change these results.

It is also worth noting that the coefficients on growth, even when divided by three, are larger in absolute value than the coefficient on the current level of income. This implies that a regression of life-satisfaction on lagged income and current growth will still show a negative effect of growth; the coefficient on lagged income is the same as that on current income in the original regression. This finding rules out the possibility that the negative effect of growth comes from identifying those countries whose current income overstates their long-run income, and who should therefore be less happy than those who have been richer for longer. However we count it, income makes countries happy and income growth makes them unhappy.

The countries of Eastern Europe and of the former Soviet Union have some of the lowest levels of life-satisfaction in the world, much lower than is warranted by their incomes. The upheavals associated with the fall of communism are likely factors, though they do not show up as working through the fall in incomes, if only because these countries were not among the countries with the worst growth record from 2000 to 2003.
Consideration of earlier growth rates is not possible, because many of the countries did not exist in 1990, and are therefore excluded from the regression in column (2), see the footnote to the table. But given the robustness of the estimated negative effects of growth between columns (1) and (2) it seems most likely that it is features of the transition other than declines in income that are responsible for dissatisfaction with life.

Columns 3, 4, and 5 investigate the role of life expectancy and its change. Because life expectancy is the standard period measure, formed from current survival rates, it is not a long-term measure that changes only slowly in response to changes in the epidemiological and social environment. There were 28 countries in the sample whose life expectancies fell from 1990 to 2000. Eighteen of these are in sub-Saharan Africa—as are all of the double-digit declines—one is Iraq (sanctions and Saddam Hussein), and the other nine are countries of the former Soviet Union, including Russia itself. (Note that estimates of life-expectancy are available for these countries in 1990, although income estimates are not.) Yet the table shows that life-expectancy plays a very limited role in explaining international variations in life satisfaction. The introduction of the life-expectancy variables has only a small effect on the estimated effects of income, so that it is not true that income is standing proxy for life-expectancy. Life-expectancy itself does not show up significantly in any of the regressions, though the increase in life-expectancy from 1990 to 2000 has a significant positive effect on average life-satisfaction. The estimated coefficient is 0.047, which would exert a sizeable negative effect on life-satisfaction in countries in sub-Saharan Africa with large declines in life expectancy, such as Botswana (–20 years), Zimbabwe (–19 years) or South Africa (–16 years), but
cannot explain the low levels of life satisfaction in the countries of the former Soviet Union where the declines were much smaller, such as Russia (~2 years).

I have repeated the life-satisfaction and health regressions using infant and child mortality measures instead of, and in addition to, life expectancy; these are arguably better measures of the extent to which basic needs are fulfilled. But these generate no new insights, largely because of the strong interrelations between the three measures in a single cross-section. Indeed, in the poorest and highest mortality countries, amongst whom the variation in life-expectancy is largest, life expectancy is often imputed using measures of infant and child mortality, so it is not surprising that the data should be unable to separate their effects, if indeed they exist.

I have also experimented with a measure of the HIV prevalence rate (taken from the World Development Indicators). Although this is certainly measured with error, it reliably identifies those countries most severely affected, and to ensure that is the case, I constructed a dummy variable that identifies the thirteen countries with an estimated 2003 prevalence of 5 percent or more, namely Botswana, Burundi, Cameroon, Haiti, Kenya, Mozambique, Malawi, Nigeria, Rwanda, South Africa, Tanzania, Zambia, and Zimbabwe. Whether added to the regressions in column (1) or column (3) of Table 2, the dummy attracts a small and insignificant coefficient (not shown). This is surely an extraordinary finding, that reported life satisfaction is unaffected by a plague whose severity is unparalleled in modern times. And even if people do not know that they are HIV positive, it is hard to believe that their satisfaction with life is unaffected when more than a fifth of adults are infected, and when burials of the victims are a daily occurrence.
Figure 2 showed that the relationship between life-satisfaction and income differs across the age-groups or, perhaps more obviously, that the relationship between life-satisfaction and age depends on the level of development. Most notably, among the low and middle-income countries, reported life-satisfaction declines as people age. However, among the rich countries, the lines come together, and eventually cross so that, among the world’s richest countries, there is no monotone relationship between life-satisfaction and age. Figure 6 explores these regularities in more detail for the countries of Eastern Europe and the former Soviet union among which there is an almost uniform picture of life-satisfaction declining with age, often quite sharply. (These graphs show unconditional averages of life-satisfaction with age with neither standardization nor controls.) Whatever aspects of the transition it is that make people unhappy, the effects are much more pronounced among the elderly. Perhaps it is they who have suffered the adverse consequences of disruption, who were most satisfied with their old lives, and who cannot expect to live long enough to see any improvements that might occur in the future. For them, there is only transition, no promised land.

Figure 6 shows similar unconditional age-profiles of life-satisfaction for the rich English speaking countries of the world. Not only are these people generally much happier than people in the previous figure, but their life-satisfaction is in most cases U-shaped in age. Because of our inability to control for cohort or period effects, we cannot tell whether these U-shapes are age-effects for people in the English speaking countries, or some mixture of period and cohort effects. The results from other countries (not shown here) suggest that there is no general (unconditional) U-shape for life-satisfaction with age in the 2006 cross-section. Not only is life-satisfaction declining with age in the
countries in Figure 6, but there is also somewhat milder (and less uniform) decrease with age in Latin America. There is no systematic pattern in the countries of Africa, Asia, or Western Europe other than Britain and Ireland. The obvious explanation is that there are period or cohort effects that are specific to countries or groups of countries. The age-related decline in life-satisfaction in Eastern Europe and the former Soviet Union in Figure 6 is unlikely to be a pure age effect, but is more probably an interaction of a period effect (the transition) that was particularly hard on the elderly. In the rich English-speaking countries, the relatively high satisfaction of the elderly might be linked to the substantial intergenerational transfers from young to old in those countries, though this explanation would also hold for much of the rich world.

I have replicated the income results in Tables 1 and 2 by age group, and the results are qualitatively similar to those for all age groups combined. For each of the age groups, the level of national income is an important positive determinant of life-satisfaction, and the rate of growth of income a negative determinant. In further work, when the individual income numbers from the World Poll are more developed, it may be possible to use the data to look at income distribution across age groups, or indeed to compare the within national effects of income on happiness with those estimated here from the international comparisons.

3. Perceptions of health, disability, and health systems

I now turn from overall life-satisfaction to satisfaction with health. World Poll respondents are asked whether they are satisfied or dissatisfied with the state of their personal health. The next question is whether they “have any health problems that
prevent you from doing any of the things people of your age usually do,” again with a dichotomous answer, yes or no. I refer to this as the disability question. Figures 8 (for health satisfaction) and 9 (for disability) are drawn in the same way as Figure 2, plotting the fraction satisfied with their health or the fraction with a disability against average per capita income, for everyone together—the circles with diameters proportional to population—or separately by age—the fitted nonparametric curves. In Figure 9, for disability, the circles are drawn separately for two of the age groups, ages 30–39 (black circles), and ages 60–70 (blue circles).

These figures show that people are less often disabled and are more likely to be satisfied with their health in richer countries, and that, less surprisingly, they become more disabled and less healthy as they age. As was the case for life satisfaction, the rate at which health satisfaction deteriorates with age is greater in poor and middle income countries than in rich countries, where income seems to provide some protection against the effects of aging. Indeed, at the top right of Figure 8, the 50–59 age group is actually less satisfied with its health than is either of the two older groups. There is even a similar reversal for reported disabilities between the 50–9 and 60–9 group in Figure 9. It is most improbable that these reversals can be attributed to any objective health conditions or disabilities. Perhaps the 50–9 group is particularly intolerant of the first signs of aging.

In health satisfaction, as in life satisfaction, the countries of Eastern Europe and the former Soviet Union report extraordinary low levels. Ukraine (rank 1), Russia (3), Georgia (4), Armenia (5), Belarus (6), Moldova (8), Hungary (9), Latvia (12), Estonia (14), Romania (15), and Kazakhstan (17) are eleven of the twenty worst countries in the world in health satisfaction, ranking alongside much higher mortality countries such as
Haiti (2), Rwanda (7), Uganda (10), Burundi (11), Cambodia (14), Chad (16), Benin (18), and Cameroon (19). (South Korea is 20th, for no immediately obvious reason.) In all of these countries, the fraction of people reporting themselves satisfied with their health is between a half and two-thirds, which is worth contrasting with the situation in some of countries worst-hit by the HIV/AIDS epidemic, Tanzania (70 percent), Zimbabwe (75 percent), Botswana and South Africa (both 78 percent), and Kenya (82 percent). Indeed, the percentage of Kenyans satisfied with their health is the same as the proportion of Britons, and is a percentage point higher than the fraction of Americans. While objective mortality rates affect health satisfaction, at least in changes if not in levels, so do other factors, and the declines in life expectancy in the countries of the former Soviet Union have had a much larger effect on reported life satisfaction than have the much larger declines in life expectancy in the African countries affected by HIV/AIDS.

We can also examine the way that health satisfaction declines with age and how that decline varies internationally. In the 15–19 age group, almost everyone is satisfied with their health. In the rich countries, satisfaction falls relatively slowly, and in the US, actually improves with age after age 50, (probably coincidentally) overtaking the generally more stoical British at around the age at which the respective age-specific mortality curves cross. In the Eastern European and former Soviet Union group, health satisfaction falls very rapidly with age, and very large fractions of the elderly report themselves as dissatisfied with their health.

Table 3 explores the correlates of health satisfaction, following the same general procedures as in Table 2. Column (1) shows, consistently with the figures, that the fraction of people satisfied with their health is higher in higher income countries
although, even allowing for the fact that the scale is a tenth as large, the effect is a good deal smaller than for life-satisfaction. As was the case for life satisfaction, recent economic growth is negatively associated with health satisfaction conditional on the level of GDP per capita. In column (2), the level of life expectancy has no effect on health satisfaction, although increases in life expectancy between 1990 and 2000 are associated with higher health satisfaction. Because declines in life expectancy are associated either with HIV/AIDS (itself mostly in sub-Saharan Africa), or with the transition countries of Eastern Europe, I have constructed three dummy variables, one for the Eastern European countries, one for sub-Saharan Africa, and one the dummy for HIV prevalence that has already been described. The first of these dummies (“east”) attracts a negative and significant coefficient, the second (sub-Saharan Africa) an insignificantly negative one, and the third (HIV) a coefficient that is neither negative nor significant. With these dummies included, the change in life expectancy no longer has any effect, and the significance of the income variables is also reduced. This is perhaps not surprising given the evidence in Figure 8, where it is clear that the poor health satisfaction in the transition countries could not be attributed entirely to the objective decrease in life expectancy. These results also reinforce the fact that even high levels of HIV prevalence do not much affect the health satisfaction reports, certainly not in proportion to their dire effects on mortality. I have also interacted the dummies with the change in life expectancy (results not shown) to test the possibility that the changes in life expectancy have different effects in the different areas, or with different causes, but the estimated effects are neither significant nor informative.
One variable which is correlated with average health satisfaction is what people think of their healthcare system. The World Poll asks people to report whether or not they have confidence in their health care or medical system. The average of this for each country is entered in the last row of the last column of Table 3, where it has a large and statistically significant coefficient. Of course, because this is itself a subjective response, we do not know whether it is a better or worse indicator of the actual performance of the healthcare system than health satisfaction is itself a good indicator of objective health. Put differently, both health satisfaction and healthcare confidence may be functions of third factors which themselves vary by region, time, or age group. And it would certainly be unwarranted to interpret the last column of the table as evidence that the healthcare system is effective in delivering health.

The degree of confidence in the healthcare system varies widely from country to country, and although it is correlated with income—see Figure 10—the correlation is weak. Note particularly the astonishingly low confidence that Americans in 2006 had in their healthcare and medical system. Almost all the inhabitants of rich countries are well-satisfied with their healthcare and medical systems; that the US is an exception in this regard is well-known, see Davis et al (2007), who find also that the US does not lag in the effectiveness of healthcare, but does so in other dimensions such as equity, access, and safety. Experience is much more diverse among the poor countries of the world, but people in some poor countries (such as Vietnam, Thailand, Malaysia, and Cuba) have great confidence in their healthcare system, and the majority of poor countries do much better than does the US, even when they deliver much worse health outcomes. The ranking of the US in the World Poll (81 out of 115) is even worse than in WHO (2000),
though it should be noted that the WHO’s methodology has been robustly and convincingly challenged by several commentators, see particularly Williams (2001).

Given the high correlation between the subjective evaluations in different domains, here between personal health and the healthcare system, it is worth returning to life satisfaction and asking whether we can “explain” life satisfaction in terms of health satisfaction. This follows Easterlin (2006) who relates overall life satisfaction to satisfactions in the various domains and thus aggregating satisfactions into an overall evaluation. Certainly, if we repeat the regressions in Table 2 with health satisfaction on the right hand side, there is a large (close to 4) and statistically significant coefficient, and with this variable added, life expectancy, the change in life expectancy, and the rate of economic growth lose their significance. While such regressions are useful for understanding the life satisfaction responses (though one might just as well argue for regressing health satisfaction on life satisfaction), they are less useful for deciphering the relationship between the satisfaction reports and the objective circumstances of life.

6. Discussion
The currently dominant approach to measuring population well-being is based on Sen’s ideas of measuring people’s abilities to function, or their capabilities to lead a life worth living. Without health, there is very little that people can do and, without income, health alone does little to enable people to lead a good life. Other factors, such as education, or the ability to participate in society, are important too, although income and health tend to get the primary attention in evaluations of development progress, such as the Millennium Development Goals. For many reasons, elaborated by Sen and others, self-reports of
satisfaction with life, with income, or health are given little weight. People may adapt to misery and hardship, and cease to see it for what it is. They do not necessarily perceive their lack of freedom as a problem; the child who is potentially a great musician, but never has a chance to find out, will not express her lack of life satisfaction, and whole groups can be taught that their poor health, or their lack of political participation, are natural or even desirable aspects of a good world.

In spite of these general arguments, it is possible that reports of life satisfaction, at least on average, provide a useful summary of the different components of peoples’ capabilities. Some of the results in this paper are supportive of that position, much more so than I had originally expected. In particular, the very strong international relationship between per capita GDP and life satisfaction suggests that, on average, people have a good idea of how income, or the lack of it, affects their lives. It is simply not true that the people of India are as satisfied with their lives as the people of France, let alone Denmark, nor is it true that people in sub-Saharan Africa, or Afghanistan, or Iraq, or Cambodia, are as happy as people in India. Beyond that, the misery of many of the countries of Eastern Europe and the former Soviet Union seems plausible enough, as does the special misery of the elderly in those countries. As a result, the map in Figure 1 clearly corresponds in broad detail to what an overall map of capabilities might look like, always supposing we could construct such a thing.

But when we turn to health and its effects on life-satisfaction, the poll results diverge from what would be required in a capabilities approach. Longer life expectancy surely enables people to do more with their lives, and is perhaps the best single indicator of population health yet, conditional in income, it has no apparent effect on life satisfaction.
Instead, it is changes in the expectation of life that seem to have an effect, no matter whether life expectancy is high or low. Even satisfaction with health, a much more focused question, is not related to life expectancy, though in some specifications it is sensitive to changes in life expectancy, consistent with a focusing illusion for health. The extraordinary low health satisfaction ratings for Eastern Europe and the countries of the former Soviet Union are a testament, not to their poor population health, but to the effects of a decline in health among a population that was used to a better state of affairs. It is also the case that in the rich countries it is people in their 50s, not in their 60s or 70s, who report the least satisfaction with their health and the highest level of disability. Again, this is a group whose health is actually much better than that of their elders, but who are experiencing health problems for the first time; perhaps it is not poor health that is hard to bear, but the first intimations of mortality. In the poor countries, and particularly in Africa, where the joint evolution of man and parasites has ensured that, for hundreds of thousands of years, morbidity has been a constant companion throughout life, Iliffe (1995), health satisfaction declines rapidly with age. But this does not mean that health satisfaction is a good indicator of health capabilities in the poorest countries. That it is not so is demonstrated by the fact that countries with high rates of HIV prevalence do not systematically report poorer health status, a finding that is in line with earlier reports that self-reported health measures are often better in places where people are sicker, and presumably more adapted to being sick, Sen (2002), Chen and Murray (1992).

In spite of the positive relationship between life satisfaction and national income, and in spite of the plausibility of unhappiness and health dissatisfaction in the countries of Eastern Europe, neither life satisfaction nor health satisfaction can be taken as reliable
indicators of population wellbeing, if only because neither adequately reflects objective conditions of health.

Even if this conclusion is accepted—and for a somewhat different view see Graham (2005)—the satisfaction questions are clearly of interest in their own right, as is the analysis of their correlates. These are among the best measures that we have of an important aspect of human experience, and we need to understand what and why they are. In this respect, this analysis of the World Poll data has confirmed a number of earlier findings, but has yielded some new and different results. One surprising finding is Figure 3, the close to linear relationship across countries between average life satisfaction and the logarithm of income per head. There is no evidence that the cross-country effects of income vanish among the richer countries. It is also true that life satisfaction responds to changes in circumstances, though the effects of economic growth are negative and not positive, as would be predicted by previous discussion and previous micro-based empirical evidence. Health satisfaction, in contrast, responds very weakly to (perhaps unsatisfactory) objective measures of health, though there is a response of the correct sign to changes in life expectancy, at least in some specifications.

List of works cited:


Table 1

Cross-country regressions of average life-satisfaction on the logarithm of per capita GDP

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income cutoff</td>
<td>None</td>
<td>None</td>
<td>$y &lt; 12,000$</td>
<td>$y \geq 12,000$</td>
<td>$y \geq 20,000$</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>$\ln y$</td>
<td>0.850</td>
<td>–0.859</td>
<td>0.708</td>
<td>1.743</td>
<td>0.617</td>
<td>0.751</td>
<td>0.677</td>
</tr>
<tr>
<td>s.e.</td>
<td>(0.051)</td>
<td>(0.778)</td>
<td>(0.085)</td>
<td>(0.287)</td>
<td>(0.649)</td>
<td>(0.081)</td>
<td>(0.064)</td>
</tr>
<tr>
<td>$(\ln y)^2$</td>
<td>--</td>
<td>0.101</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>s.e.</td>
<td></td>
<td>(0.046)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\ln y*I(y&gt;12,000)$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.032</td>
<td></td>
<td></td>
</tr>
<tr>
<td>s.e.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.021)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\ln y*I(y&gt;20,000)$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.073</td>
<td></td>
</tr>
<tr>
<td>s.e.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.716</td>
<td>0.728</td>
<td>0.480</td>
<td>0.521</td>
<td>0.040</td>
<td>0.722</td>
<td>0.752</td>
</tr>
<tr>
<td>Number of countries</td>
<td>114</td>
<td>114</td>
<td>78</td>
<td>36</td>
<td>24</td>
<td>114</td>
<td>114</td>
</tr>
</tbody>
</table>

Notes: $y$ is real chained GDP per capita in 2003 in 2000 international $ from the Penn World Table version 6.2. $I(y>12,000)$ is an indicator variable that is 1 if $y$ is greater than 12000, similarly for $I(y>20,000)$. Regressions are not weighted by population.
Table 2

Cross-country regressions of average life-satisfaction on levels and lags of per capita GDP and on life-expectancy

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income cutoff</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>y &lt; 12,000</td>
<td>y &gt;= 12,000</td>
</tr>
<tr>
<td>ln y 2003 s.e.</td>
<td>0.860 (0.049)</td>
<td>0.890 (0.053)</td>
<td>0.910 (0.110)</td>
<td>0.698 (0.173)</td>
<td>1.297 (0.359)</td>
</tr>
<tr>
<td>growth rate 00–03 s.e.</td>
<td>–4.47 (1.41)</td>
<td>–3.65 (1.58)</td>
<td>–4.64 (1.39)</td>
<td>–3.50 (1.52)</td>
<td>–8.02 (5.76)</td>
</tr>
<tr>
<td>growth rate 90–00 s.e.</td>
<td>-- (2.51)</td>
<td>–3.32 (2.51)</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Life expectancy 2000 s.e.</td>
<td>--</td>
<td>--</td>
<td>–0.009 (0.011)</td>
<td>0.001 (0.014)</td>
<td>0.038 (0.046)</td>
</tr>
<tr>
<td>LE 2000 – LE 1990 s.e.</td>
<td>--</td>
<td>--</td>
<td>0.047 (0.019)</td>
<td>0.036 (0.022)</td>
<td>–0.074 (0.120)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.740</td>
<td>0.763</td>
<td>0.757</td>
<td>0.556</td>
<td>0.582</td>
</tr>
<tr>
<td>Number of countries</td>
<td>114</td>
<td>103</td>
<td>114</td>
<td>78</td>
<td>36</td>
</tr>
</tbody>
</table>

Notes: See Table 1. Among the countries that are dropped between columns (2) and (3) are Azerbaijan, Belarus, Georgia, Kazakhstan, Lithuania, Latvia, Moldova, Tajikistan, and Ukraine.
Table 3

Cross-country regressions of average health-satisfaction

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln y 2003 &amp; s.e.</td>
<td>0.0219</td>
<td>0.0472</td>
<td>0.0156</td>
<td>0.0127</td>
</tr>
<tr>
<td>growth rate 00–03 &amp; s.e.</td>
<td>–1.346</td>
<td>–1.384</td>
<td>–0.722</td>
<td>–0.725</td>
</tr>
<tr>
<td>Life expectancy 2000 &amp; s.e.</td>
<td>--</td>
<td>–0.003</td>
<td>–0.000</td>
<td>–0.000</td>
</tr>
<tr>
<td>LE 2000 – LE 1990 &amp; s.e.</td>
<td>--</td>
<td>0.007</td>
<td>0.001</td>
<td>0.000</td>
</tr>
<tr>
<td>east</td>
<td>--</td>
<td>--</td>
<td>–0.137</td>
<td>–0.118</td>
</tr>
<tr>
<td>ssa</td>
<td>--</td>
<td>--</td>
<td>–0.056</td>
<td>–0.041</td>
</tr>
<tr>
<td>hiv</td>
<td>--</td>
<td>--</td>
<td>0.015</td>
<td>–0.001</td>
</tr>
<tr>
<td>confidence in healthcare &amp; s.e.</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.121</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.303</td>
<td>0.357</td>
<td>0.529</td>
<td>0.559</td>
</tr>
<tr>
<td>Number of countries</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>112</td>
</tr>
</tbody>
</table>

Notes: East is a dummy that is one for Eastern Europe and the Former Soviet Union, SSA is a dummy that is one for sub-Saharan Africa, and HIV is a dummy that is one if the estimated prevalence of HIV/AIDS is greater than 5 percent among 15 to 49 year olds.
Figure 1: Life satisfaction around the world: population means of 0 to 10

Figure 2: Life satisfaction, per capita GDP, and age
Figure 3: Life satisfaction and the logarithm of GDP per capita

Figure 4: Life satisfaction and national income from the World Values Surveys, 1981, 1990, and 1996
Figure 5: Life Satisfaction and log per capita income, World Poll (red points) and World Values Surveys (blue points) compared

Figure 6: Declining life-satisfaction with age in Eastern Europe and the FSU
Figure 7: U-shaped life satisfaction in rich English-speaking countries

Figure 8: Health satisfaction, age, and income
Figure 9: Disability, age, and income

Figure 10: Satisfaction with healthcare and income