



Trends in happy life expectancy in Russia, 1994–2015

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ABSTRACT

Although the physical health status of the Russian population has improved over time, limited attention has been paid to the role of subjective well-being (SWB), and even less is known about its relationship with objective health conditions. Using the concept of health expectancy, this study estimates the number of years expected to be satisfied with life (happy life expectancy [LE]) for Russian men and women aged 50 years and older between 1994 and 2015. Data on age-specific prevalence rates of life satisfaction were obtained from the Russian Longitudinal Study of Higher School of Economics (RLMS-HSE), and the life tables were from the Human Life Table Database. We also tested the correlation between macroeconomic indicators and happy LE at age 50. Results based on the Sullivan method demonstrated substantial increases in happy LE at age 50 for both genders during the study period. Changes in happy LE and the percentage of happy life were significant for both genders. Furthermore, happy LE fluctuated during the 1990s but increased in the early 2000s. Importantly, the results from more recent years show stagnation and slight declines in happy LE for men and women. We also noted correlations between happy LE at age 50 and macroeconomic indicators, including gross domestic product (GDP), inflation, unemployment, and poverty rates. Taken together, the findings suggest that Russian men and women are becoming more satisfied with life as they live longer. While health has mainly been measured by mortality and morbidity in the Russian context, the finding suggests the importance of focusing more on the positive aspect of population health.

1. Introduction

The health status of the Russian population has improved over time. Total life expectancy (LE) at birth, for instance, rose from 64.5 years in 1995, the peak of the post-Soviet mortality crisis, to 72.9 years in 2018 (Federal State Statistics Service (Rosstat), 2020). Increases in LE have been the result of reductions in mortality at all ages, and, in particular, among middle-aged individuals (Grigoriev et al., 2014; Timonin, Danilova, Andreev, & Shkolnikov, 2017). Recent studies have provided evidence of upward trends in health-related quality of life as well, as indicated by increases in the length of life spent in good self-rated health and without experiencing chronic illnesses (Andreev, McKee, & Shkolnikov, 2003; Ramonov, 2011).

Most of our knowledge about the improving health of the Russian population is based on objective health conditions, assessed primarily by mortality and morbidity. Given that health can be conceptualized through both negative and positive aspects, it is important to analyze the subjective dimension of health, that is, subjective well-being (SWB) (Diener, 1984; Veenhoven, 1996; 2001). Limited attention has been paid, however, to the subjective dimension of health in the Russian

population. The literature on physical health and SWB remains largely separate, leaving it an open question as to how the SWB of the Russian people is related to its physical health status.

The present study employs the concept of health expectancy and estimates the average duration of life expected to be satisfied with life, namely, happy life expectancy (happy LE, hereafter), for men and women aged 50 and older between 1994 and 2015. We explored changes over the past 20 years to determine the relationship between the objective (i.e., LE) and subjective (i.e., happy LE) well-being of the Russian population. Further, we conducted the correlation analysis to assess the relationship between macroeconomic factors and happy LE at age 50. With this research, we contribute to the existing literature by (1) clarifying the role of SWB in the physical health status of the Russian population; (2) examining changes over 20 years in happy LE in relation to LE; and (3) offering new evidence from Russia, a country where relatively little is known about the role of the positive aspects of health in overall population well-being.

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1.1. Past research

The extension of longevity and the increased prevalence of chronic illnesses worldwide have made it critically important to ask not only how long we live, but also how those additional years of life are spent (Jagger et al., 2007; 2008). This is primarily because people can live longer despite worsening health status (Crimmins, Hayward, & Saito, 1994). To address this issue, researchers have proposed an indicator of health expectancy (Sanders, 1964). It partitions the expected remaining years of life into various health states, allowing us to simultaneously consider the length of life and quality of life lived (Robine, Jagger, Crimmins, Saito, & Van Oyen, 2020). Researchers have estimated various types of health expectancy measures, such as the length of life to be spent without difficulty in activities of daily living (ADLs) or instrumental ADLs (IADLs) (Jagger et al., 2007), heart disease (Crimmins, Hayward, Ueda, & Saito, 2008), cognitive impairment (Jagger et al., 2016), or depression (Steensma et al., 2016).

Most existing work on health expectancy has focused on the presence of specific physical or mental health conditions. It is important to note, however, that health can be understood from both negative (e.g., impairment and illness) and positive (e.g., signs of good functioning) aspects (Veenhoven, 1996). One example of positive health involves subjective evaluations of a sense of well-being, known as SWB (Veenhoven, 2001). Researchers have had a long-standing interest in how people feel about their lives, which has resulted in a large literature on SWB in the fields of sociology, psychology, and economics (Saris & Andreenkova, 2001). Self-reported happiness and life satisfaction have been widely used as key SWB measurements. These two indicators represent satisfaction with life in general, as opposed to satisfaction with specific domains of life such as income, work, housing, and marriage (Saris, 2001).

Recently, there has been a growing interest in moving beyond the pathology-centered approach and incorporating SWB in the estimation of health expectancy. Using the prevalence of happiness as an indicator of SWB, Yang (2008) estimated happy LE, which denotes the average number of years of life expected to be lived in a happy state, among the US population for the period between 1970 and 2000. The study noted large increases in the number of years as well as the proportion of life to be lived in a happy state over the three decades. Furthermore, recent studies document inequalities in happy LE between as well as within countries. Solé-Auró, Jasilionis, Li, and Oksuzyan (2018) focused on life satisfaction and found marked differences in happy LE at age 50 across 16 European countries. In Spain, there are inequalities in happy LE at age 50 by occupation position (Lozano & Solé-Auró, 2021). These past studies suggest the importance of considering positive dimensions of health when computing health expectancy; therefore, SWB-based health expectancy, namely happy LE, offers new insights into overall population well-being.

1.2. SWB in the Russian context

Prior research on the physical health of the Russian population has documented the following consistent pattern: population health remained poor during the 1990s but started to increase after the early 2000s. Mortality rates remained high during the period immediately following the collapse of the Soviet Union, reaching its peak in the middle of the 1990s, and fluctuated for the rest of the 1990s (Gavrilova, Semyonova, Evdokushkina, & Gavrilov, 2000; Grigoriev et al., 2014; Shkolnikov, Andreev, McKee, & Leon, 2013; Timonin et al., 2017). High death rates were concentrated among working-age individuals, particularly men, and the major causes of death included ischemic heart diseases and external causes (Brainerd & Cutler, 2005; Murphy, 2011). Nevertheless, since the early 2000s, trends have been reversed, showing a continued decline in mortality rates.

While trends in the physical health status of the Russian population have been well documented (Gavrilova et al., 2000; Grigoriev et al.,

2014; Shkolnikov et al., 2013; Timonin et al., 2017), relatively less attention has been paid to the SWB of the Russian people. Existing studies that consider the SWB of the Russian population have yielded several key findings. First, SWB, when measured through self-reported life satisfaction or happiness, is lower in Eastern Europe, including Russia, than in Western Europe; this phenomenon is known as the “happiness gap” (Djankov, Nikolova, & Zilinsky, 2015; Guriev & Zhuravskaya, 2009). Low levels of SWB in the East can be attributed to the abrupt transition from communist regimes (Easterlin, 2009; Foa, Inglehart, Ponarin, & Karabchu, 2018; Guriev & Zhuravskaya, 2009). In fact, there was a large drop in SWB (measured by life satisfaction and happiness) among the Russian population during the period immediately after the disintegration of the Soviet Union (Foa et al., 2018). Second, a continued increase in SWB was observed throughout the post-Soviet period. An analysis by Brzezinski (2019) used data from the Russian Longitudinal Monitoring Survey of Higher School of Economics (RLMS-HSE) and reported significant reductions in unhappiness, as defined by the percentage of respondents who were not at all or less than satisfied with life or neither satisfied or unsatisfied with life, for the period between 1994 and 2014. Upward trends in SWB have been observed in other post-communist countries, narrowing the gap between Eastern and Western Europe (Djankov et al., 2015). Third, socioeconomic factors are closely associated with the SWB of the Russian population. Patterns of gross domestic product (GDP) growth have been shown to be similar to those of life satisfaction in the former communist countries (Easterlin, 2009). In Russia, growth in personal income and return to employment have had a strong impact on changes in the levels of life satisfaction (Brzezinski, 2019; Graham, Eggers, & Sukhtankar, 2004).

Evidence reviewed to this point clearly indicates that both the objective well-being (i.e., physical health status) and SWB (i.e., self-reported life satisfaction or happiness) of the Russian population grew in parallel throughout the post-Soviet period. Past research, however, has left the following two points unaddressed. First, it is unclear how the Russian population’s objective and subjective life conditions are related. The literature on physical health and SWB remains largely separate, and thus efforts to incorporate SWB in the estimation of health expectancy for the Russian population have been absent. Consequently, it remains to be addressed whether Russians are becoming more satisfied with life as they enjoy longer lives. Second, we only know the factors related to SWB. Although past research has indicated that a country’s macroeconomic conditions are important for life satisfaction (Brzezinski, 2019; Ferrer-i-Carbonell & Van Praag, 2001; Graham et al., 2004; Saris & Andreenkova, 2001; Veenhoven, 2001), it remains to be addressed whether we observe similar patterns when physical health and SWB are combined in one measurement of health expectancy.

Using a large nationally representative sample of the Russian population, the present study computes the length of life expected to be satisfied with life in general (i.e., happy LE) for men and women aged 50 years and older and explores its changes between 1994 and 2015. The following three specific questions guide our analysis: (1) What is the relationship between overall LE and happy LE? (2) How has happy LE changed during the period between 1994 and 2015? and (3) How are the country’s macroeconomic conditions related to happy LE during the study period?

2. Materials and method

2.1. Data

The current study considered life satisfaction as a measurement of SWB, as, in the Russian context, life satisfaction is an appropriate measurement of SWB (Saris, 2001; Saris & Andreenkova, 2001). The calculation of happy LE requires two pieces of information: age-specific prevalence rates of life satisfaction and period life tables. Data on life satisfaction were obtained from 20 waves of the RLMS-HSE. It is a

household-based survey that began in 1992 (Phase I) to monitor the effects of post-Soviet reforms on the economic well-being of households and individuals in Russia. The second phase of the RLMS-HSE (1994 and onward), based on the multistage probability sampling method, provided a nationally representative sample of households in Russia. Owing to changes in the sampling scheme between Phases I and II, this study utilized the data from Phase II (1994–2015). The target sample size in Phase II was 4000 households based on 98 primary sampling units. Using interviewer-administered questionnaires, data have been collected annually since 1994, except for 1997 and 1999. Details on the design of the RLMS-HSE are available elsewhere (Kozyreva, Kosolapov, & Popkin, 2016). Gender-specific life tables were obtained from the Human Life Table Database (<https://www.lifetable.de/cgi-bin/index.php>), which is a collection of life tables for 141 countries and areas around the world. While complete life tables for Russia are available until 2017, this study focuses on the period between 1994 (the starting year of the RLMS-HSE Phase II) and 2015 (the most recent year of the data on life satisfaction from the RLMS-HSE).

2.2. Measures

Self-reports of life satisfaction were based on the respondents' answers to the question, "To what extent are you satisfied with your life in general at the present time?" Responses to this question included "fully satisfied," "rather satisfied," "both yes and no," "less than satisfied," and "not at all satisfied." We categorized respondents into "satisfied" ("fully satisfied" and "rather satisfied" combined), "neither satisfied nor unsatisfied" ("both yes and no"), and "unsatisfied" ("less than satisfied" and "not at all satisfied" combined). We confirmed that the question wording and response categories remained unchanged in the RLMS-HSE throughout the study period. Given that prevalence rates are subject to errors and fluctuations inherent in sample data (Lynch & Brown, 2010), we first aggregated the data into five-year age intervals and then used the demographic technique of smoothing to calculate the predicted prevalence of life satisfaction for each age group (Land, Guralnik, & Blazer, 1994). We estimated multivariate regression models with gender, age, the quadratic term of age, and an interaction between age and gender as covariates to obtain predicted age-specific rates of being satisfied, neither satisfied nor unsatisfied, and unsatisfied with life. Notably, past research on happy LE employed the same analytical technique (Solé-Auró et al., 2018; Yang, 2008; Yang & Waliji, 2010).

Prior research suggests that the low levels of SWB among the Russian population reflect socioeconomic hardships experienced during the transition from communism (Graham et al., 2004; Saris, 2001; Veenhoven, 2001). The period following the demise of the Soviet Union led to a severe economic crisis, exemplified by declining GDP, increasing unemployment and poverty rates, and hyperinflation (Aslund, 2007). The present analyses included purchasing power parity (PPP)-adjusted GDP per capita in constant international dollars, unemployment rates, inflation rates, and poverty ratio.

2.3. Analytical design

We used the Sullivan (1971) method to estimate the remaining number of years to be satisfied with life (i.e., happy LE) and to be unsatisfied with life (i.e., unhappy LE) for those who were aged 50 years and older. Using the formula by Andreev, Shkolnikov, and Begun (2002), this can be modeled as:

$$\text{Happy/Unhappy } LE_x = \frac{1}{l_x} \sum_x^m L_x(\pi_x)$$

where l_x is the number of survivors at age x , L_x is the person years lived for each age interval, and π_x is the smoothed prevalence of each state of life satisfaction for the age interval (for further details on the Sullivan method, see Jagger, Van Oyen, & Robine, 2014). Age is top-coded at 100

(after 2003, 100 and up), and we used 5-year age intervals, except for the final interval of 85 and above. We estimated happy/unhappy LE for age 50 and older and reported the results at age 50, because evidence suggests a U-shaped curve between age and happiness in Russia, with a nadir at around age 50 (Blanchflower, 2021). The standard errors of happy and unhappy LE were obtained using the formula provided by Mathers (1991). Furthermore, to assess the relationship between LE and happy LE and how it has changed over time, we used the decomposition technique of Andreev et al. (2002) to partition changes in happy LE between 1994 and 2015 into the effects of mortality and life satisfaction. Past research on happy LE has used the same analytical technique to determine the degree to which mortality and SWB contribute to changes in happy LE (Lozano & Solé-Auró, 2021; Solé-Auró et al., 2018).

The second part of the analysis numerically tested the relationship between macroeconomic indicators and gender-specific happy LE at age 50 between 1994 and 2015. We conducted a correlation analysis and reported Pearson correlation coefficients between gender-specific happy LE and (1) GDP, (2) inflation rates, (3) unemployment rates, and (4) the poverty ratio. The analyses were conducted in Stata 15.0 (StataCorp, 2019).

3. Results

3.1. Trends in life satisfaction and happy LE between 1994 and 2015

We begin by looking at the predicted age-specific prevalence of being satisfied with life between 1994 and 2015 (Supplementary Fig. S1). Three points are noteworthy. First, there are upturns in the prevalence of life satisfaction during the study period for men and women. In 1994, at age 50, 14.1% of men and 10.1% of women were satisfied with life, but the results reached 46.9% and 44.7% in 2015, respectively. Second, in most years, the estimated prevalence of life satisfaction is higher among older individuals than among young people. Third, men, on average, have a higher prevalence rate of being satisfied with life compared to their female counterparts. Across all age groups and survey years, the prevalence of life satisfaction is consistently higher for men than for women.

Next, using this information as the input into life tables, we calculated the duration of life expected to be spent in each state of life satisfaction at 50 years of age. It is clear from Table 1 that, over the past two decades, there was a large increase in the duration of life (i.e., LE) and life expected to be satisfied (i.e., happy LE). Between 1994 and 2015, LE at age 50 rose by 4.9 years for men and 4.0 years for women. The magnitude of change was greater for happy LE, as there was a 7.6-year increase in happy LE for men, compared with 9.4 years for women. In 2015, at age 50, Russian men had LE of 22.6 years, and 10.5 years (46.6% of which were expected to be satisfied with life in general). Women of the same age had LE of 29.9 years and happy LE of 12.6 years (42.0%). Changes in happy LE between 1994 and 2015 were significant for both genders. To further confirm trends in happy LE in relation to LE, we partitioned the changes in happy LE between 1994 and 2015 into the effects of mortality and life satisfaction. We found that the changes in happy LE were largely due to changes in life satisfaction for men and women. Out of the 7.6-year difference in men's happy LE at age 50 (from 2.9 years in 1994 to 10.5 years in 2015), 6.1 years were attributable to differences in life satisfaction. For women, 8.7 years of the total difference of 9.4 years (from 3.2 years in 1994 to 12.6 years in 2015) were due to changes in life satisfaction.

Trends in LE and happy LE at age 50 over 20 years are summarized in Fig. 1 and Supplementary Fig. S3. Several important pieces of information can be gleaned. First, trends for LE and happy LE differed during the 1990s. Between 1994 and 1998, LE at 50 increased for both men (2.3-year increase) and women (1.3-year increase), whereas happy LE declined for men (0.6-year decrease) and women (1.0-year decrease). Combining these results suggests that between 1994 and 1998, the LE of the Russian population increased, but their SWB decreased. Second, the

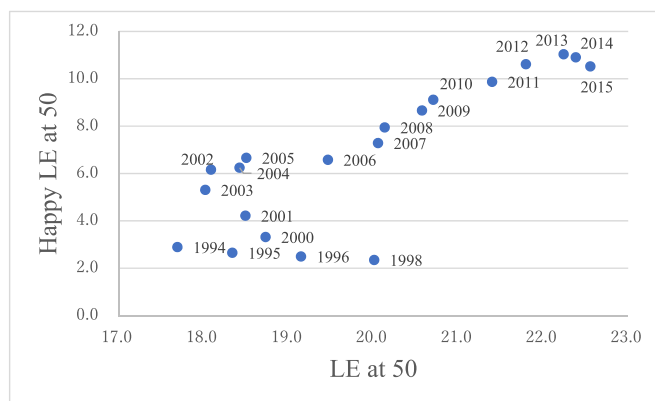
Table 1
Estimates of life expectancy (LE), happy LE, unhappy LE, and the percentage of happy life at age 50 stratified between 1994 and 2015.

	LE	Happy LE	Unhappy LE	% of happy
Men at 50				
1994	17.7	2.9 (1.9–3.9)	11.4 (10.8–12.)	16.3 (10.9–21.8)
1995	18.3	2.6 (1.6–3.7)	12.5 (11.8–13.1)	14.4 (8.9–19.9)
1996	19.1	2.5 (1.4–3.6)	13.3 (12.6–13.9)	13.0 (7.5–18.6)
1998	20.0	2.3 (1.2–3.5)	14.7 (14.1–15.3)	11.7 (6.0–17.5)
2000	18.7	3.3 (2.3–4.4)	11.6 (10.9–12.3)	17.7 (12.1–23.3)
2001	18.5	4.2 (3.3–5.1)	10.4 (9.7–11.1)	22.8 (17.8–27.8)
2002	18.1	6.2 (5.4–7.0)	8.0 (7.2–8.7)	34.1 (29.6–38.5)
2003	18.0	5.3 (4.5–6.1)	8.8 (8.0–9.5)	29.4 (24.8–34.1)
2004	18.4	6.2 (5.4–7.1)	8.1 (7.3–8.9)	33.9 (29.3–38.4)
2005	18.5	6.7 (5.8–7.5)	7.5 (6.7–8.4)	36.0 (31.4–40.5)
2006	19.5	6.6 (5.8–7.4)	8.5 (7.8–9.3)	33.8 (29.6–38.0)
2007	20.1	7.3 (6.5–8.1)	8.2 (7.4–9.0)	36.3 (32.2–40.4)
2008	20.1	7.9 (7.1–8.8)	7.6 (6.8–8.4)	39.5 (35.4–43.5)
2009	20.6	8.7 (7.9–9.5)	7.1 (6.3–7.9)	42.1 (38.2–46.)
2010	20.7	9.1 (8.5–9.8)	7.1 (6.4–7.7)	44.0 (40.9–47.1)
2011	21.4	9.9 (9.2–10.5)	6.9 (6.2–7.6)	46.1 (43.2–49.1)
2012	21.8	10.6 (10.0–11.2)	6.4 (5.7–7.1)	48.7 (45.9–51.5)
2013	22.2	11.0 (10.4–11.7)	6.1 (5.3–6.8)	49.6 (46.8–52.4)
2014	22.4	10.9 (10.2–11.6)	6.3 (5.5–7.1)	48.7 (45.7–51.8)
2015	22.6	10.5 (9.8–11.2)	6.3 (5.5–7.2)	46.6 (43.5–49.8)
Changes	+4.9	+7.6	–5.1	+30.3
	LE	Happy LE	Unhappy LE	% of happy
Women at 50				
1994	25.9	3.2 (2.1–4.2)	18.3 (17.6–18.9)	12.2 (8.0–16.4)
1995	26.3	2.7 (1.5–3.9)	19.2 (18.6–19.8)	10.3 (5.9–14.7)
1996	26.8	2.3 (1.1–3.4)	20.3 (19.7–20.9)	8.5 (4.1–12.9)
1998	27.2	2.2 (1.0–3.3)	21.5 (21.–22.1)	7.9 (3.6–12.2)
2000	26.6	3.7 (2.6–4.8)	18.1 (17.4–18.8)	14.0 (9.9–18.1)
2001	26.5	4.8 (3.7–5.8)	16.5 (15.8–17.2)	18.0 (14.1–21.9)
2002	26.2	7.3 (6.4–8.2)	13.8 (13.0–14.5)	27.8 (24.4–31.2)
2003	26.2	6.3 (5.3–7.2)	15.5 (14.9–16.2)	23.8 (20.3–27.3)
2004	26.7	7.0 (6.1–8.0)	14.1 (13.4–14.9)	26.4 (22.9–29.9)
2005	26.8	7.3 (6.3–8.2)	13.3 (12.5–14.1)	27.1 (23.6–30.6)
2006	27.4	7.8 (7.0–8.7)	13.5 (12.7–14.2)	28.6 (25.5–31.7)
2007	27.9	8.4 (7.5–9.3)	13.2 (12.5–14.0)	30.1 (27.0–33.2)
2008	28.0	9.7 (8.9–10.5)	12.3 (11.5–13.0)	34.6 (31.6–37.5)
2009	28.4	10.5 (9.7–11.4)	11.9 (11.1–12.7)	37.1 (34.2–40.0)
2010	28.4	11.0 (10.3–11.6)	11.0 (10.4–11.7)	38.6 (36.2–40.9)
2011	29.1	12.2 (11.5–12.8)	10.5 (9.8–11.2)	41.8 (39.6–44.1)
2012	29.3	12.9 (12.2–13.5)	9.8 (9.1–10.5)	43.8 (41.7–46.0)
2013	29.7	13.0 (12.4–13.7)	9.6 (8.9–10.3)	43.9 (41.8–46.1)
2014	29.8	13.1 (12.4–13.8)	9.8 (9.0–10.5)	43.9 (41.5–46.2)
2015	29.9	12.6 (11.9–13.3)	10.0 (9.2–10.7)	42.0 (39.6–44.4)
Changes	+4.0	+9.4	–8.3	+29.8

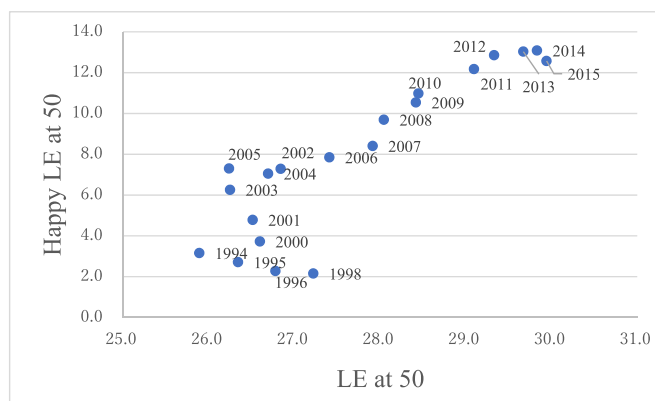
Note. Changes refer to the difference between 1994 and 2015.95% confidence intervals are in parentheses.

first few years of the 2000s were characterized by reductions in LE and fluctuations in happy LE. In particular, there was a decline in happy LE between 2002 and 2003 among men and women. These trends were reversed after 2004, when both LE and happy LE started to increase. Finally, the results in more recent years suggest stagnation and slight decreases in happy LE, while LE continued to improve for both genders.

Similar patterns of increases and decreases were observed in the percentage of happy life (LE divided by happy LE), which remained low in the 1990s but increased continuously thereafter. During the study period, the percentage of happy life increased by 30.3 percentage points among men and 29.8 percentage points among women. The changes in happy LE in relative terms were statistically significant for both genders. Consistent with the results of happy LE, the percentage of happy life also declined in recent years. In addition, women in Russia had longer LE and happy LE than men. This gender gap has grown over time, reaching a significant level in recent years. However, women’s advantages disappeared when the results were interpreted in relative terms. Over the past 20 years, the percentage of happy life has consistently been greater for men than for women.



a. Men



b. Women

Fig. 1. Relationship between life expectancy (LE) at age 50 and happy LE at age 50, in years.

Table 1 also presents the expected duration of life in an unhappy state (i.e., unhappy LE). Over the past two decades, unhappy LE at 50 decreased by 5.1 years for men and by 8.3 years for women. Similar to happy LE, unhappy LE increased through cycles of increases and decreases; accordingly, upturns occurred in the 1990s, followed by fluctuations during the first few years in the 2000s and then continued reductions. It is important to note that unhappy LE started to increase for women after 2013.

3.2. Correlation between happy LE and macroeconomic factors

We tested the correlation between macroeconomic factors and happy LE between 1994 and 2015. Table 2 summarizes the descriptive statistics of the variables used in the analysis and Pearson’s correlation coefficients. The values of macroeconomic indicators display variations by year. The 1990s had worse socioeconomic conditions compared with the 2000s, which were characterized by declines in GDP, high inflation rates, increased unemployment rates, and widespread poverty. The results of the correlation analyses show that GDP was positively and strongly correlated with happy LE at 50 for both genders. In contrast, unemployment rates and poverty levels were inversely correlated with happy LE at 50 for both men and women. Inflation rates were weakly correlated with happy LE. Results for unhappy LE were opposite to those for happy LE; we noted a negative correlation between GDP and unhappy LE, and the rest of the indicators were positively correlated to unhappy LE for men and women. Additionally, to address the issue of time lag between macroeconomic indicators and SWB (Inglehart, Foa, Peterson, & Welzel, 2008), we ran models using factors from one and three years prior to each survey year and found that the results remained almost unchanged, except that unemployment rates were not strongly

Table 2

Description of variables used in the analysis and correlation coefficients with happy/unhappy life expectancy (LE) at age 50.

	Mean	Minimum	Maximum	Correlation coefficient			
				M: Happy LE	W: Happy LE	M: Unhappy LE	W: Unhappy LE
GDP ¹	19,748.9	12,358.2 (1998)	26,332.4 (2013)	0.9683***	0.9383***	-0.9069***	-0.9558***
Inflation rates ²	39.8	5.1 (2012)	307.7 (1994)	-0.5134*	-0.5060*	0.4758*	0.4893*
Unemployment rates ³	7.8	5.2 (2014)	13.3 (1998)	-0.8458***	-0.8429***	0.8935***	0.8904***
Poverty ratio ⁴	1.0	0.0 (1996)	4.8 (2011–2015)	-0.8629***	-0.8686***	0.8847***	0.8938***

Source. The World Bank Databank (<https://databank.worldbank.org/home.aspx>).

Notes. 1 Gross domestic product (GDP) per capita based on purchasing power parity (PPP) in constant 2017 international dollars. 2 annual percentage change in the cost to the average consumer of acquiring a basket of goods and services. 3 percentage of the labor force without but available for and seeking employment. 4 percentage of the population living on less than 1.90USD per day at 2011 international prices. Years are in parentheses. M refers to men, and W refers to women. ***p < 0.001; **p < 0.01; *p < 0.05.

correlated with happy or unhappy LE for both genders (Supplementary Table S2).

4. Discussion

Although it is widely recognized that the physical health of the Russian population has improved over time, limited attention has been paid to the role of SWB. Consequently, we know relatively little about the relationship between physical health and SWB. In this study, we extended prior research by analyzing changes in happy LE in relation to LE among Russian men and women aged 50 and older. Three important findings stand out. First, the Russian population has experienced substantial increases in happy LE at age 50 over the past 20 years in both absolute and relative terms. Between 1994 and 2015, significant increases were observed in men and women in terms of the number of years and percentage of life expected to be satisfied with life. Importantly, improvements in happy LE outpaced those in LE at age 50 over the study period. Second, our results revealed long-term trends in happy LE. For both genders, happy LE fluctuated during the first decade after the breakup of the Soviet Union, but increased continuously after 2004; also, similar fluctuation patterns were seen in the percentage of happy life. It is important to note, however, that the results of recent years are characterized by slight declines in happy LE for both genders. Third, we found a correlation between happy LE and various macroeconomic factors. While GDP was positively correlated with happy LE, inflation and unemployment rates and poverty levels were negatively correlated with happy LE for men and women.

Previous studies have reported downturns and upturns in the length of life (Grigoriev et al., 2014; Shkolnikov et al., 2013; Timonin et al., 2017) during the post-Soviet period. The present study followed this line of research, focused on the levels of life satisfaction as an indicator of SWB, and investigated how happy LE has evolved over the two decades in relation to LE. The results reveal large increases in both LE and happy LE among Russian men and women. Although there is evidence of a U-shaped curve between age and SWB in Russia with those around age 50 at the bottom of the curve (Blanchflower, 2021), the present findings illustrate marked improvements in their SWB over the past two decades. Importantly, happy LE at 50 improved faster than LE at 50, indicating that Russian adults are becoming more satisfied with life as they enjoy longer lives. This point was further confirmed by the decomposition analyses. Changes in life satisfaction, rather than those in mortality, contributed to improvements in happy LE between 1994 and 2015. Overall, by employing the concept of health expectancy, this research extends our understanding of the role of SWB in physical health status, thereby filling the gap in the literature about the relationship between the subjective and objective well-being of the Russian population.

Our results also illustrate divergent patterns of development in LE and happy LE over the past two decades. The last few years of the 1990s were characterized by fluctuations in mortality rates, with a surge in 1998 when a severe financial crisis hit the country, indicating how the post-1998 socioeconomic turmoil yielded unbeneficial consequences to

the health of the population (Gavrilova et al., 2000). Our estimates of LE declined toward 2000, and happy LE was the lowest in 1998. These results imply that the socioeconomic catastrophe during the last few years of the 1990s damaged both the objective and subjective health conditions of the population. While the years in the early 2000s are characterized by upward trends in LE and happy LE, a closer examination of the results reveals divergent patterns of development. In fact, LE at 50 fluctuated during the first few years of the 2000s, but it has progressively increased since 2003. Happy LE also continued to increase after 2000 (except in 2003) and reached its peak in 2013 for men and 2014 for women. During the same period, the Russian economy enjoyed continued growth, except for a few years after the great recession of 2008. Moreover, the annexation of Crimea in 2014 created a euphoric atmosphere in the country, thereby leading to an increase in happiness among the Russian population (Vedomosti, 2019). Our results also show upturns in happy LE until 2014. It is important to note, however, that the pace of increase in happy LE clearly slowed down, and there is evidence of stagnation and a slight decline in happy LE after 2014. Interestingly, during the same period, LE at 50 continued to increase without interruption for both genders. Taken together, these results indicate how trends for LE and happy LE differed between 1994 and 2015, and the divergent trends are particularly evident in more recent years.

Our results also illustrate the correlation between macroeconomic factors and happy LE at age 50, adding to the literature on the association between Russia's socioeconomic conditions and SWB (Brzezinski, 2019; Ferrer-i-Carbonell & Van Praag, 2001; Graham et al., 2004; Saris, 2001). A large body of literature investigates the relationship between happiness and national wealth (Easterlin, 1995). Evidence to date has been mixed, with some studies supporting a happiness-wealth association (Di Tella, MacCulloch, & Oswald, 2003) and others refuting it (Bjørnskov, 2008). The current analyses reveal that the SWB of the Russian population, conceptualized through happy LE, was correlated with macroeconomic indicators, such as GDP, inflation and unemployment rates, and poverty levels.

4.1. Limitations

The present study has some limitations that should be considered in future research. The first issue is within-population variation in happy LE. The prevalence of life satisfaction or happiness differs among population subgroups (Yang, 2008; Yang & Waliji, 2010), but, in this study, happy LE was stratified only by gender. This was because we used the Sullivan method based on gender-specific period life tables to compute happy LE. A series of past analyses have demonstrated substantial differences in the expected length of life in a happy state by education (Yang & Waliji, 2010), race (Yang, 2008), and occupation (Lozano & Solé-Auró, 2021). Overall, exploring social variations in life satisfaction among the Russian population is an interesting topic for future research.

The second limitation has to do with the question of life satisfaction. The validity and reliability of the global happiness question in a social survey have been established (Veenhoven, 1996). The RLMS-HSE also

includes a question on happiness, but the information is available only after 2012. This study focused on life satisfaction as a measurement of SWB, but this is not without limitations. For instance, the neutral category of “both yes and no” is included in the list of answers, raising the possibility that the responses might be skewed toward the middle (Graham et al., 2004). Moreover, answers to the life satisfaction item may be negatively skewed because this item is listed in the questionnaire after a series of questions on objective life conditions, such as employment, income, and household finances (Graham et al., 2004). Continued efforts to determine the reliability and validity of the life satisfaction question are warranted.

The third limitation concerns the study period. Our analyses are restricted to the period between 1994 and 2015. The RLMS-HSE started in 1992 (Phase I); however, due to changes in the sampling scheme, we only used data from Phase II (1994 and onward). Therefore, this study cannot examine how the Russian people’s SWB changed during the period immediately following the collapse of the Soviet Union. Furthermore, the last observation point in this study was 2015, the final year for which the cross-sectional data on life satisfaction from the RLMS-HSE are available. This study reported a slight decline in happy LE after 2014, a peak in the Russian population’s SWB. There is indeed evidence of downturns in the level of happiness in the past few years. According to Helliwell et al. (2021), in 2020, the score of life evaluation, ranging from 0 (the worst possible life) to 10 (the best possible life), was 5.495, changing from 5.501 between 2017 and 2019, and Russia ranked 60th out of 95 countries in the world. These findings indicate recent declines in the SWB of the Russian people. However, due to data limitations, the present study cannot investigate changes in happy LE beyond 2015. Overall, future research will benefit from methodological considerations, such as the addition of more observations when data becomes available.

Finally, we only tested the correlation between macroeconomic indicators and happy LE. This is largely because we have 20 observations (the number of survey years between 1994 and 2015), and there is the possibility that the errors are strongly correlated over time (Fox, 2008). In this study, we found that GDP, inflation and unemployment rates, and poverty ratio were closely correlated with happy/unhappy LE at age 50, but these results do not imply causal relationships between macroeconomic factors and SWB in the Russian context. A better understanding of the determinants of happy LE requires research that explores macro-level and individual-level factors that contribute to the SWB of the population. This is an interesting area for future research, given the recent decline in SWB and economic slowdown in Russia.

4.2. Conclusions

Health has long been conceptualized through mortality and morbidity in the Russian context. Our findings show that it is important to pay attention to the subjective dimension of health and understand it in relation to objective health conditions. This study advances the understanding of changes in the well-being of the population in contemporary Russia, and more broadly, of the contributions of SWB to overall population health. Although the levels of longevity and happiness remain low in Russia (Helliwell et al., 2021; Saris & Andreenkova, 2001; Veenhoven, 2001), this study offers evidence of substantial improvements in both objective and subjective life conditions over the past 20 years among Russian adults. These findings suggest the importance of departing from the traditional pathology-oriented approach and focusing more on the positive dimensions of population health.

CRedit authorship contribution statement

Yuka Minagawa: Conceptualization, Methodology, Forman analysis, Writing – original draft, Writing – review & editing, Visualization.

Ethical statement

This research used data from the “Russian Longitudinal Monitoring Survey, RLMS-HSE”, conducted by the National Research University Higher School of Economics and ZAO “Demoscope” together with Carolina Population Center, University of North Carolina at Chapel Hill and the Institute of Sociology RAS.

Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ssmph.2021.101005>.

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