Has South Korea Squandered its Demographic Dividend?

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South Korea is generally held up as one of the Asian Tigers that very successfully capitalized on the demographic dividend: the period of time when decreasing fertility leads to fewer children and a large population concentrated in the working ages raises per capita income and increases the support ratio. This demographic dividend is not automatic; Bloom, Canning, and Sevilla (2003) argue that critical public policy to support the dividend must be in place, including public health, family planning, education, and economic policies to promote labor-market flexibility, trade and savings.

There were two drivers of the demographic dividend in Korea: demography and economics, both of which were affected by public policy. The Third Republic of South Korea (1963-1972) instituted strong reforms that were key to setting the stage for the demographic dividend; the Fourth Republic of South Korea (1972-81) cemented the trajectory with a highly centralized government under the leadership of Park Chung Hee, until his death in 1979. Key reforms in public health, family planning, and education made during these nearly two decades paired with economic growth set up the textbook demographic dividend. Mason and colleagues (Mason and Kinugasa 2008; Mason and Yamaguchi 2007) estimate that the changing age structure as a result of low fertility resulted in a "demographic bonus" that may be responsible for 10-50 percent of the economic growth of Asian countries, including Korea.

Family Planning

The South Korean baby boom of the 1950s, coupled with slow economic growth was a concern to Korean policy makers who saw a cycle of poverty. The Planned Parenthood Federation of Korea (PPFK) was started in April of 1961, with financial and technical assistance from the International Planned Parenthood Federation (Moon 2005). The National Family Planning program was initiated in 1962 as part of the first Five-Year Economic Plan; the government worked closely with PPFK and policies were included in successive five-year economic plans (Cho and Lee 2000). The drop from a TFR of 6 in the early 1960s to replacement level fertility in 1983 was hailed as a success (Choe and Park 2006; Eun 2006; Kim 2005; Kwon 2001). The slogans imploring citizens to limit births matched the rapid economic expansion and social change of that era in the ROK. "Have few children and achieve prosperity" was an early slogan, followed by "Sons or daughters, stop at two and raise them well" in the 1970s (Choe and Park 2006). The economic incentives offered to women for using contraceptives and the state disseminated messages promoting small families coincided with the country's rapid rise of urbanization and industrialization and women's desires to limit pregnancy and childbirth (Moon 2005).

As a result, the South Korean total fertility rate (TFR) declined from 4.53 children per woman in 1970 to 2.06 in 1983 when it dipped below replacement level fertility for the first time. The TFR continued to decline, reaching a low of 1.076 in 2005, but rebounded to 1.297 in 2012 and then dropped back down to 1.190 in 2013 (KOSIS 2013).

Public health

Public health systems came to South Korea later than European countries and the United States. President Park Chung Hee pushed economic development during his administration, and only in the last two years of his presidency was he persuaded that social

health insurance was a key component of economic development. Starting in 1977 there was a roll-out of health coverage that would eventually cover the entire population. Although it took nearly 12 years, by 1989 the majority of the population was covered by National Health Insurance (NHI).

The improvement in the health status of the population is reflected in the increase in life expectancy at birth. South Korea is currently ranked 42nd in the world (CIA 2013) with an overall life expectancy at birth of 79.55 years: 76.4 years for males and 82.9 for females. This was an increase from 59.8 years for males and 66.7 years for females as of 1970 (Chun et al. 2009). Infant mortality, another marker of the overall health in a country decreased from 23 in 1985 (Chun et al. 2009) to 4.4 in 2012 (US Census Bureau 2013).

Education

The third feature of public policy that was key for South Korea's demographic dividend was education. The transformation came out of the drive to erase the Japanese multi-tiered educational system to a more egalitarian system. As a result the investment in human capital has led one of the most highly educated populations in the world with 63 percent of 25-34 year olds with a tertiary degree, the highest percentage among OECD Countries (OECD 2011). Not only is the percentage of college graduates high in South Korea, the educational system is ranked as one of the top in the world (The Economist Intelligence Unit 2012).

Economics

As Gribble and Bremner (2012) have noted, while demographic changes are necessary to achieve the demographic dividend, there must be concomitant features in place that include investment in human capital, good governance, and strong economic policies leading to economic growth.

South Korea followed an export-oriented development strategy for its economic development; exports account for more than half of the country's GDP, with China as its major trading partner (OECD 2012). Among the Organisation of Economic Co-operation and Development (OECD) countries, Korea has had one of the fastest growing economies with the real gross domestic product (GDP) increasing by more than 4 percent per year during the past decade (OECD 2012). Korea recovered quickly from the 2008 global crisis and had average growth of real GDP of nearly 5 percent between 2008 and 2011.

The rapid industrialization of the country has resulted in rapid urban growth over the past 50 years. In the period from 1970 to 1990 the percentage of the population living in urban areas increased from 41 percent to 74 percent. Between 1990 and and 2012 the rate increased to 83 percent.

But what follows the demographic dividend? This paper argues that although South Korea has continued to experience economic growth, the demographic transition has resulted in age restructuring and social issues, which are already affecting Korea negatively and may be exacerbated in the near future. The first part of this paper highlights the age restructuring; the second section discusses Lee and Mason's proposed "Second Demographic Dividend" for South Korea; the third section analyzes a "Retreat from the Demographic Dividend"; with a concluding section.

AGE RESTRUCTURING

The long-term decline to the lowest-low fertility levels in South Korea (See Figure 1) is unlikely to be reversed unless: 1) social and economic changes are made to better integrate mother and worker roles for women; 2) patriarchal customs are eliminated that distance the

fathers from most child care and household duties; and 3) childcare for young children becomes more available and of higher quality.

The Korean population will increase only because of population momentum over the next several years. The Korean Statistical Information Service (KOSIS) projects that the peak population (medium projection series) will occur in 2032 with a population of 52.115 million (2013); the US Census Bureau (2013) projects the zenith will occur in 2023 with a population of 49.406 million.

It is not only the overall population size that is of concern, but also the age composition. Although the overall working-age population will remain stable for the next 15 years, the 15-29 age cohort will shrink by about 20 percent while the 30-64 age cohort will continue to grow (Jones 2013). By 2050, over a third of the population (37.39 percent, medium assumption from KOSIS) will be aged 65 and over (see Figure 2).

There are many reasons to hypothesize that fertility in South Korea will remain low including: the high parental investment into their children's education ("education fever"); a patriarchal society with strong family ties resulting in strong gender roles and a low female labor participation rate for mothers; delayed marriage with little movement toward cohabitation; and low rates of immigration (Anderson and Kohler 2012; Frejka, Jones and Sardon 2010; Jones 2007). Virtually all childbearing in Korea takes place within marriage--as of 2008 only 1.8 percent of births were to mothers who were not married--but shifting values among young people have made marriage and childbearing more of a choice rather than a duty (Lee 2010). This retreat from marriage has resulted in a rapid rise in the mean age at marriage and in the mean age of childbearing. In 1970, 88 percent of women aged 25-29 in South Korea were married; in 2005 only 40 percent of women in that age group had married (Westley, Choe and Retherford 2010). Mean age at first marriage for women rose

from 24.1 years in 1985 to 28.1 years in 2007 (Lee 2009); mean age at first birth was 27.2 in 1995 and was 29.6 in 2005 (Choe and Retherford 2009; Lee 2009).

To date immigration to South Korea has not appeared to solve the age restructuring and retreat from marriage. As of 2010 over 10 percent of all registered marriages in South Korea included a foreign spouse (*The Economist* 2011). In 2012 there were 300,177 foreigners who entered South Korea; marriage immigration visas numbered 17,001, of which 91 percent were to women (KOSIS 2013). Anti-immigration sentiment remains high, however, and it is unlikely that immigration will be the factor that turns around low fertility in South Korea (Park and Stephen 2013).

THE SECOND DEMOGRAPHIC DIVIDEND

The OECD (2012) projects that Korea's growth rate per capita will decelerate from 4 percent in the current decade to about 2.25 percent during the 2030s. In spite of the expected projected low fertility continuing into the foreseeable future, Lee and Mason (2013) are bullish on Korea capitalizing on human capital investment. They propose that the critical factors include: 1) increased accumulation of wealth as a result of a larger elderly population; 2) increased life cycle savings for a longer period of post-retirement; and 3) declining child dependency.

Lee and Mason (2013) admit that, "heavy reliance on transfer systems in any form to meet old-age needs may short-circuit the effect of population aging on the demand for retirement wealth and the accumulation of assets and capital." In analyses of Asian countries they have found that if one-third of the needs of elderly are met through transfers and two-thirds by assets that there is "substantial capital accumulation in a closed economy." In essence a successful economy heavily weighted by the elderly relies less on labor and

more heavily on capital. In the past, familial transfers have had the greatest importance for Koreans; Lee and Mason are cautiously optimistic that public transfers will expand to surpass that of familial transfers in Korea.

Another key factor in their optimistic view of the future relies on spending on education and health. Investments in children have increased with a decline in fertility, but Lee and Mason propose that higher levels of education will increase productivity in the labor force, thereby offsetting the decrease in the number of people in the working ages. This combined with increased assets invested domestically will assist in tempering the falling support ratio. They conclude with hopes that more women will participate in the labor force and that people will remain in the labor force longer.

RETREAT FROM THE DEMOGRAPHIC DIVIDEND

Unfortunately the future of Korea is more complex than outlined by Lee and Mason and a second demographic dividend is unlikely. The effects of the demographic dividend are being exhibited differently by the three broad age groupings of the population: children, the working age population, and the elderly. Each age group will be discussed separately to see how some of the benefits from the (first) demographic dividend are likely to be lost.

The Children

In many ways the children of South Korea have benefitted from the demographic dividend. While policy makers are concerned about low fertility, the result of the lowest low fertility has been increasingly smaller cohorts of children, thus competition for university and employment should decline over time, if the same or larger number of slots are available. It is likely that schools and universities will contract, however, which will leave universities and

jobs as competitive as currently are. Just over a fifth (21.1 percent of the population) in 2000 was aged 0-14; in 2013 it is 14.68 percent; and for the medium projection series for 2050, the percentage will be 9.94. This is not merely a result in the growth of the elderly; the numbers of children aged 0-14 will decrease from 9.9 million in 2000 to 7.4 million in 2013, to 4.8 million by 2050 (KOSIS 2013).

Korean children have definitely benefitted from attending school in a country usually ranked as one of the top school systems in the world. The 2009 Programme for International Student Assessment (PISA) data ranked Korea first in reading and math scores, and third in science (Ministry of Education 2013). In the most recent PISA Survey (2012) Korea ranked 5th in math (after Shanghai/China, Singapore, Hong Kong/China, and Chinese Taipei), 5th in reading and 6th in science (OECD 2013a).

One of the (outside, and sometimes internal) criticisms of the educational system, though, is the reliance on and importance of *hagwons*: the afterschool tutoring schools. Nearly three-quarters (74 percent) of students attended some form of afterschool program; the average cost was $2600 per student per year (Ripley 2011). This accounts to 2 percent of the GDP being spent on tutoring. As a comparison, in Finland—which is Korea's peer country trading off first and second place in educational rankings—only 13 percent of students attend after-school tutoring (Ripley 2011). The reliance on *hagwons* that may go until 10 at night is that students are very tired during the day and are reportedly sleeping through regular classes at school (Ripley 2013).

The competitiveness of the schools is a trickle-down (or trickle-up) effect. The top three universities (Seoul National University, Korea University, and Yonsei University) are extremely competitive to get into, and which university a Korean student attends is critical for what job that person will get. By 2014 counselors will be put into every middle and high

school to guarantee the fairness of a new admissions system that will, "…assess students' potential, aptitude, and character, and select them based on their goals and capacity, not just their test scores" (Ministry of Education 2013). How the admissions policy will change in lieu of the contraction of the cohorts will remain to be seen.

Tertiary education is largely supported by Korean families. As of 2008 Korea had the third highest tuition fees paid by households of all OECD countries with the public sector paying just over a fifth (22 percent) of the cost of tertiary education: a third of the OECD average of 69 percent (OECD 2012).

While nearly three-quarters (72.5 percent in 2011) of high school students advance to college, about half of university graduates are unable to find regular (contract, full-time) jobs. In 2009 a quarter of tertiary graduates under the age of 30 were neither employed nor attending school, which was double the OECD average (OECD 2012).

The Working Age Population

Like children, the working age population has benefitted from the demographic dividend in economic terms. Park Chung-Hee's government pursued rapid industrialization with a cheap and abundant labor force, and the ability to export low-end industrial consumer goods (Amsden 1989). Real GDP per capita increased from (U.S.) $1,537 in 1960 to $30,254 in 2011 (Shin and Park 2013). Urbanization came at a rapid rate, reaching 70 percent by the late 1980s (Chang 2013). The massive urbanization resulted in a decline in agricultural employment from 63 percent of the labor force in 1963 to 11 percent in 2000 (Chang 2013). The rapid industrialization and economic growth transformed existing regional and national cities, as well as industrial cities developed strategically throughout Korea. The transformation to the industrialized country of today has come at societal costs, however,

particularly for families who had to adjust to long hours of work, aspirations of upward mobility, and the investment into children.

For years South Koreans lodged the most work hours per year of any OECD country; in 2008 Mexico surpassed Korea for the first time and has retained that position up through 2011, so Koreans are now working the second longest hours (OECD 2013b). As of 2011, Koreans worked on average 2,090 hours per year, as compared with the OECD average of 1,765. The long hours create strain for working mothers and place more of a burden on women whose employed husbands have limited time with their families.

Korean women have had a difficult time reconciling work and parenthood. Among women aged 25 and 54 the labor force rate in 2010 was 62 percent, the third lowest of OECD countries (OECD 2012). In addition, the gender wage gap is the highest of all OECD countries, in part because women are much more likely to participate in non-regular jobs (fixed-term contracts, temporary agencies, etc). Maternity leave is currently set at 90 days and there is very little opportunity for part-time work.

Traditionally childcare for young children in Korea has been the responsibility of the family. Spending on pre-primary education was 0.2 percent of GDP in 2008, which was the second lowest of the OECD countries (OECD 2012). Although there is a new government initiative that will enroll all five-year-olds in kindergartens or childcare facilities at no cost to parents, there are few provisions for children under the age of five. With the shortage of public childcare facilities, the burden for caring for young children generally falls to families, and most specifically to mothers. As the family system has become more nuclear, there is less of a support network from other relatives for childcare. Although the number of childcare facilities is increasing, they do not meet the demand. Lee (2010) estimates that childcare facilities meet only 30 percent of the demand. In 2003 there were 4,405 childcare

facilities (public and workplace); by 2007 this had increased to 17,650. Even with the nearly quadrupling of facilities, the number of spots available falls far short of demand. As a result, nearly half of all women quit their jobs when they have a child. Even among women who work, house chores and childcare are significant. Working women spend nearly three and a half hours on household chores/child care on an average working day, which is about seven times as much time as their husbands (Lee 2010).

Although there are no school fees for public elementary and middle schools, extra-curricular studies and private after school academies (*hagwons*)--which are attended by most children--are very expensive and time consuming. Korean families spent 10.7 percent of average household income per student in 2010 on private tutoring (OECD 2012). The cost of raising and educating a Korean child is estimated to be at least US $253,000 (Jones, Straughan and Chan 2009).[1]

Tertiary education has become expected of all children; 93 percent of parents reported in a recent survey that they expect their children to obtain at least a tertiary degree (OECD 2012). The oversight of the child's education traditionally falls to the Korean mother and excellence is expected. A South Korean mother was quoted as saying, "Most Korean mothers want their children to get 100 on all the tests in all the subjects" (Dillon 2008). Mothers wake up early to prepare lunch and supper boxes for the children and supervise children until they are home from the *hagwons*; the preparation time for the college entrance exam is nearly a full-time job for mothers (Harlan 2012). The high costs of childcare and extra-curricular education--combined with the change in women's status--have

[1] There are approximately 28,000 hagwons in South Korea, and gross approximately $15 billion annually. For students who cannot physically attend a *hagwon*, online study is offered by companies such as Megastudy, which was expected to have a profit of $300 million by 2010 (Goh-Grapes 2009).

increased the costs of having a child to women and families. Korean families remain committed to giving children the highest quality education possible to ensure that they are successful in the highly competitive educational system and labor force, which only intensified after the 1997 financial crisis (Eun 2007).

The hyper-competitiveness for educating children is also evident in the Korean phenomenon of "goose families," *kirogi kajok,* also sometimes called wild goose fathers or goose mothers. Goose fathers send their wives and children to English-speaking countries; the fathers visit on an annual basis, with the notion that children who are multilingual have a competitive edge (Anderson and Kohler 2012). The number of school children living abroad with their mother may be as high as 40,000 (Onishi 2008). The fathers who do not have the resources to visit their children and wives are dubbed "penguin fathers." Kim Seong-kon, a professor of English at Seoul National University and president of the American Studies Association of Korea expressed the view that, "The unnatural phenomenon of wild geese daddies is a clear sign of something wrong in our society" (Goh-Grapes 2009).

The Elderly

It is the elderly who have been affected the most—and the most negatively—by the demographic dividend. Traditionally the care of the elderly was primarily a family responsibility based on Confucian family values. This reliance on the family until very recently led to weak public policy for the Korean elderly. This has been exacerbated by smaller families with fewer children to take care of the elderly, just at a time when there are more elderly in the country. A challenge for Korea is how to provide a decent level of

support for the elderly without imposing a crushing burden on the working population given the rapidly aging population (Phang 2010).

If current labor force participation rates remain at current levels for each group, the peak labor force will occur in 2022 with 27.2 million workers, but will fall by 21 percent to approximately 21.5 million by 2050 (OECD 2012). That translates to 1.2 persons in the labor force for every elderly person in 2050, compared with 4.5 in 2010.

There are virtually no private occupational pension plans in South Korea; early pension plans were developed for government in employees in 1960, for military in 1963, and private school teachers in 1975. A comprehensive public pension plan for private sector employees was introduced in 1988, but one of the limiting features of the current National Pension System (NPS) is that only 10.8 percent of those 65 and over currently receive any benefits from the public pension plan, and many of those are partial payments (OECD 2012; Shin 2010). A multi-pillar system is beginning to emerge in Korea, but many challenges remain (Phang 2010).

Currently the NPS is benefitting greatly from the demographic dividend, but that advantage will be shifting very soon given the aging population. Pension participants will peak at 18.9 million in 2014, while pension recipients are expected to increase to 11.1 million in 2059, depleting the fund by 2060 (at current contribution and payout rates) (Lee 2010).

In part because of the recent introduction of the NPS, public spending on old age benefits is quite low at the present: 1.6 percent of GDP in 2007, which was only 25 percent of the OECD average (OECD 2012), but may be as high as 7.3 percent by 2050. It is likely that additional reforms will be forthcoming as it is estimated that the pension fund will be exhausted by 2060 (Klassen and Yang 2010). When health care and other programs are

included the total cost of benefits to the elderly could exceed 25 percent of GDP by 2050 (Howe et al. 2007).

To protect against some of the financial concerns the NPS is shifting the entitlement age to 61 in 2013 and then will have a phased-in increase to age 65 by 2033 (Klassen and Yang 2010). Also, the current target of paying 60 percent of average career earnings for a worker with 40 years of work experience and with a retirement age of 60 is scheduled to decrease to 40 percent by 2028 (Gordon and Lee 2009; OECD 2012). Contributions will need to be increased even to meet these changes in the plan.

Korea has the highest rates of economically active persons aged 50 to 64 of any OECD country. This is due in part to the average retirement age of 55 for most employment contracts, which has resulted in a five-year gap for NPS eligibility, and as of 2013 will increase to a six-year gap (Phang 2010; Shin 2010). A high proportion of the population is self-employed; in 2004, about 60 percent of the workers aged 55-64 were self-employed, as were more than three-quarters of workers aged 65 and over (Shin 2010). Koreans work an additional twelve years after they are retired from a primary job, owing to the lack of public support and declining family support (Shin 2010).

Prior to the implementation of the pension system, the Korean retirement allowance system was introduced in 1953. The severance allowance is equal to "one month of wages for every year of service at the rate of average monthly wage over the last three months prior to departure" (Klassen and Yang 2010:7). For companies, this allowance was beneficial because no other financial provisions were required at the time of retirement and payment was made from current operating funds. With the increase in the number of elderly persons, the government is allowing large corporations to replace this plan with more traditional corporate pension plans (Klassen and Yang 2010). This plan was a compromise between

business leaders who wanted to abolish the retirement allowance entirely and labor organizations that sought to keep it.

Even with these plans in place, the poverty rate of the elderly in South Korea is very high. It is particularly difficult for the current cohort of the elderly who were not able to participate fully in government pension plans and who are feeling the effects of smaller extended families who are less likely to be co-resident. Just under half (45.6 percent) of persons aged 66-75 in South Korea live in a state of "relative poverty," which is defined as income below 50 percent of the average household income of the nation (OECD 2013c). In comparison, the mean poverty rate for the elderly among OECD countries was 11.3 percent. The poverty rate difference between the Korean elderly and the young is stark. Less than 10 percent (9.3 percent) of Korean children aged 0-17 lived in poverty, as compared with the OECD average of 13.3 percent for that age group. As of 2005, 14 percent of the elderly received government social assistance with monthly benefits averaging less than US $80 per person (Howe et al. 2007).

Another aspect of the changing economy and production model that has been exacerbated for the elderly has been the rapid effect of urbanization; just over a quarter (28 percent) of the total population in 1960 lived in urban areas, which increased to 82 percent by 2010. But this rapid urbanization was far less evident in the elderly population; with 38 percent of those aged 75+ living in rural areas as of 2010, more than double the percentage of the total population (18 percent) (United Nations Databank 2014). Chang (2013) refers to this phenomenon as "intergenerationally divided urban migration" and it is also indicative of the shift away the historical pattern of elderly co-residing with the eldest son and the fraying of the social fabric (Sang-Hun 2013). The Confucian social contract was built on parents doing virtually anything to take care of their children, including the very large

investment in children's education, with the knowledge that their children would take care of them in their old age. Chang (2013) refers to this period of life as empty aging for the elderly because they cannot participate in the mainstream economy and their lack of regular income, including transfers from family or government, does not allow them to be "consumer citizens" as observed in Japan and the United States.

One of aspects of social disarray is evidenced in extremely high suicide rates among the elderly. Korea has the highest suicide rates of any OECD country (OECD 2013d). Suicide rates increased by 280.7 percent between 1990 and 2010; the next highest country was Chile with a 90 percent increase over that time period. The suicide rate for Korean males increased from 19 per 100,000 in 1995 to 50 in 2010, and was 21 per 100,000 for females in 2010.

The unusual aspect about suicide in Korea is the age pattern. As seen in Figure 3, the rate increases exponentially by age for Korea, very different than the pattern seen for Japan or the United States, or any other OECD country. The suicide rate for the 75 and older age group in 2008 was 160; the OECD average for that age group is 19.3 and the country with next highest rate was Hungary at 36.1 (OECD 2009).

Suicide rates for the rural provinces are the highest in the country. As seen in Figures 4 and 5 and Table 1, rates (for the total population and by sex) for Seoul are the lowest in the country, and the metropolitan cities are close to the national average (KOSIS 2013). It is the provinces that have higher rates than the national averages. The highest rates are in the Gangwon-do province with 37.7 suicides per 100,000 persons overall, 52.8 for men and 24.4 for women.

Although there have been sporadic newspaper reports about suicides, the reports have tended to focus on unusual events such as an increase at one public housing unit in the

north of Seoul (In-tack 2012) or a report of internet-plotted suicides (*Korea Joonang Daily* 2009). One of the few academic analyses of South Korean elderly suicide pointed to the rapid societal changes that have led to a sense of anomie (Park and Lester 2008). However, the authors note that suicide is also chosen by some as an altruistic measure, that is, suicide notes left behind often state that the elderly person does not want to be a burden to the family. Chang (2013) also reports a rise in spousal or familial killing (*ganbyeongsalin*) or suicide assisted by the caregiver (*gangyeongjasal*).

Although the method of suicide is not available by age, the most common methods of suicide as recently as of 2003 were pesticides/chemicals and hanging/strangulation. These two methods alone accounted for nearly three-fourths of the suicides in the country. The government recently banned the sale of Gramoxone, one of the most lethal pesticides, which had been easily available in rural areas with the hopes that it would halve the suicide rate from pesticides (Normile and Hvistendahl 2012).

High levels of rural-to-urban migration of young people have left South Korean rural elderly with very little social support, and as noted above, very little government support to combat high levels of poverty. In Figure 6 and Table 1, we can see that a distinguishing feature of Gangwon-do is its low density: the lowest density of all of Korea's provinces. Lee and Weber (2000) found that independent living arrangements of the elderly in Seoul are dependent on their financial status, educational level, and well-being as the country shifts away from a patriarchal family system. South Korean elderly may be suffering the same fate as Chinese elderly who have been left behind in rural areas and, "…don't have much power or property that they can use to buy their children's respect and support" (Hvistendahl 2013).

In order to determine the factors leading to depression among the South Korean elderly we utilized the 2006 Korean Longitudinal Study of Aging, a panel study of persons aged 45 and older who are currently residing in households. Respondents were also given a medical examination; those data are available in this wave. Funding was provided from the Employment Insurance Fund and the survey was conducted by the Korea Labor Institute. Interviews were conducted using Computer Assisted Personal Interviewing (CAPI).

Of the 7,574 households selected who had an eligible respondent (aged 45 or over), 6,171 interviews were completed for a response rate of 81 percent. The 1,403 non-interviews were refusals. For the purpose of this analysis the sample was limited to all persons 65 and over, for an N of 3,518.

Two dependent variables are utilized for two separate logistic analyses: 1) a self-report of depression (Have you ever had feelings of being sad, blue, or depressed for two weeks or more during the past year?); and 2) a medical doctor's assessment of depression using the Center for Epidemiologic Studies Short Depression Scale (CES-D10: Standard Depression Status). There were fewer respondents who received the medical doctor's assessment so the N for that portion of the analysis dropped to 3,488.

Two sets of models were run: for each model the same control and independent variables were used for both dependent variables. The variables used in the first analyses were: age, sex, live in a city, marital status, education, have a child, receive aid from a child, co-reside with a child, currently working, and health status. All independent variables were dichotomies, for instance age is a dummy variable coded as 1 for 65-74 and 0 for 75+.

In the second set of models, the variables relating to children (if they had any, if they received any aid from any child, and whether they co-resided with any child) were deleted, and in their place two social isolation indices were created. The first one measures whether

the respondent has any friends or family that they see on a regular basis; the second variable measures whether the respondent is a part of any social group that meets on a frequent basis.

The percentage of respondents who have each characteristic are shown in Table 2. A much smaller percentage of the population lives in cities than the overall Korean population and educational levels are much lower. As we would expect, there are more women than men in the sample and a low percentage are working. Virtually everyone in the sample (97.5 percent) has at least one child. Nearly two-thirds (63 percent) of the sample are below the mean income level, and 48 percent are below the mean for assets. Most people (86 percent) do see friends and/or family on a regular basis, but 40 percent do not participate in any group activities. Three times as many people were coded by doctors as being depressed as in the self-report. This is not surprising given the stigma surrounding mental health in Korea.

The results from the logistic regressions are in Table 3. The three variables that are significant in Model 1 for both dependent variables are: marital status, education and health, with city also significant in the model with the dependent variable being the doctor's report of depression. Currently married respondents are about half as likely to be depressed as those not currently married (46 percent less likely for self-report and 43 percent for doctor report of depression). Persons with at least a high school education are 15 percent less likely to report being depressed than people with less than a high school education and are half as likely to be coded as depressed by a doctor. Those in fair or poor health are more than three times as likely to be depressed (both measures). Elderly who live in cities are 20 percent less likely to have a doctor's diagnosis of depression.

The deletion of the child-related variables in the second model resulted in fairly consistent odds-ratios for the variables in both models. For instance, people with at least a

high school education are 46 percent less likely to have a doctor's diagnosis of depression in Model 1 and 2. Marriage and health remain the key variables; the only income/asset variable to reach significance was low-income in the doctor-diagnosis model. Both of the social isolation variables were significant in both models. Respondents who did not belong to a social group were 40-50 percent more likely to be depressed; the significance of friend or family variable interaction was less significant, but persons without close friends or family were roughly 30 percent more likely to be depressed.

These results are what would be expected, but it was surprising that there was no effect of having a child, receiving aid from a child or co-residing with a child in the first set of models. The effects of income and assets are very minimal in the second model.

Married respondents who are in good health, see friends or family frequently, or belong to social groups are less likely to be depressed, and being in a city decreases the odds for doctor-diagnosed depression.

The results indicate the complexity of trying to understand the high suicide rates among Korean elderly by using depression as a proxy and a set of variables that model their interactions with family, friends, and the greater society. All of the persons who were aged 65 and older in 2006 lived through the Korean war and the massive shifts from a rural, agricultural society to an urban, heavily industrialized country. These changes were accompanied by the rapid transformation of families: the nuclear family becoming the norm, with most families having one or two children. While it is not surprising that the elderly who feel left behind—either living in rural areas or having little interaction with their children and grandchildren—are depressed, it remains a sad story that so many end their lives by suicide.

CONCLUSION

Without question South Korea has benefitted economically from the demographic dividend, however, the strong economic performance has not translated to equally strong social conditions for many segments of the population. Continued low fertility will exacerbate the aging of the population, which in turn will potentially slow down economic growth and will definitely continue to challenge the country to provide for the elderly (OECD 2012). It is the current elderly who have benefitted the least from the demographic dividend. Only a limited number of elderly are recipients of government transfers; parallel trends in increases in nuclear families and rural-to-urban migration has left the rural elderly without a social and economic safety-net, which has contributed to high rates of poverty and suicide among the elderly.

The competitive cycle of education and employment is expensive for families and comes at a tremendous psychological and economic cost to families. Children are highly educated but may find a mismatch between education and employment once they graduate from university. Gender differentials in the labor force and in the home continue to reverberate in low employment rates for women and lower salaries, while mothers taken on most of the childrearing and household duties.

What can Korea do to lessen the negative effects of the demographic dividend in the future and promote social cohesion? Although the number and percentage of elderly will increase, more will be covered by the NPS and hopefully poverty rates for the elderly will decline. The funding of the NPS is quite complex, with as many as 30 percent of workers not participating even though it is mandatory to do so (OECD 2012); it will be imperative to bring all workers into the system to make contributions so that they will be eligible for support after retirement. Other solutions for increasing contributions will need to be

considered, which may have far-reaching ramifications, such as changing the retirement age and encouraging greater private savings for retirement.

One critical element is for the government to increase mental health services for the elderly and to diminish social isolation in an effort to combat high rates of elderly suicide. It is realized that this is a difficult task given Korean society.

Education reforms are underway in Korea but need to be even more far-reaching. Early childhood education and/or daycare need to be a priority to improve all children's opportunities throughout life and will benefit families with working mothers and mothers who like to join/re-join the labor force. Public education in the primary and secondary schools must be improved with equal access to excellent schools for all children, which will be one small step in reducing the role of private tutoring and *hagwons*. Educational reforms will also require development of more opportunities following secondary schools, such as vocational training, and a realignment of parental desires for their children.

Although Korea faces some daunting challenges in light of demographic restructuring and a retreat from the demographic dividend, it has shown itself to be a very adaptable country and will likely find solutions to continue economic growth while promoting social cohesion.

ACKNOWLEDGEMENTS

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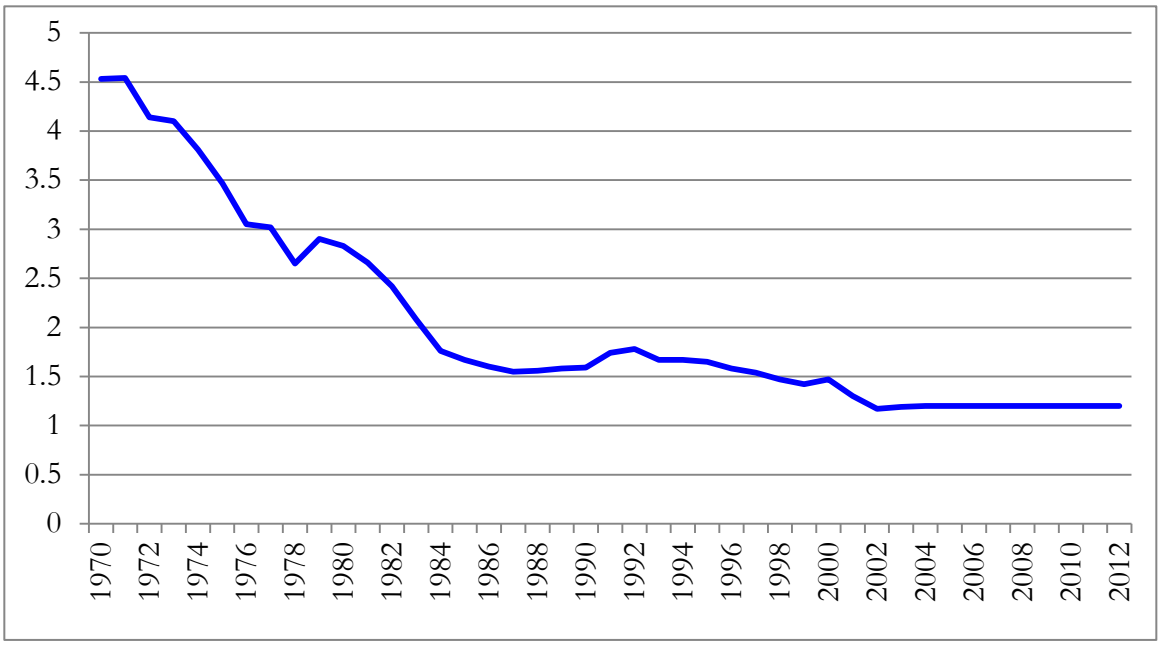
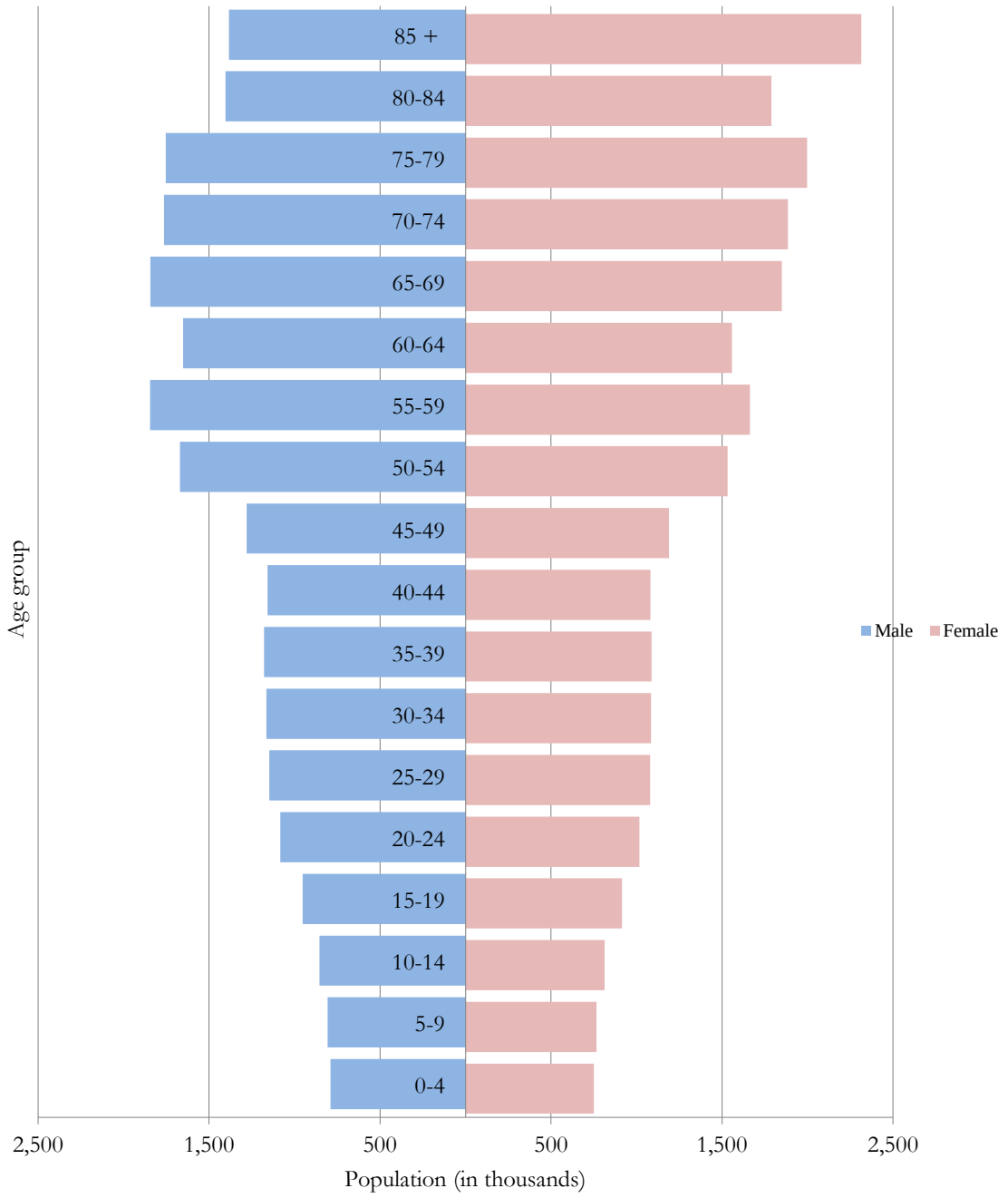
Figure 1. Total Fertility Rates, South Korea: 1970-2012



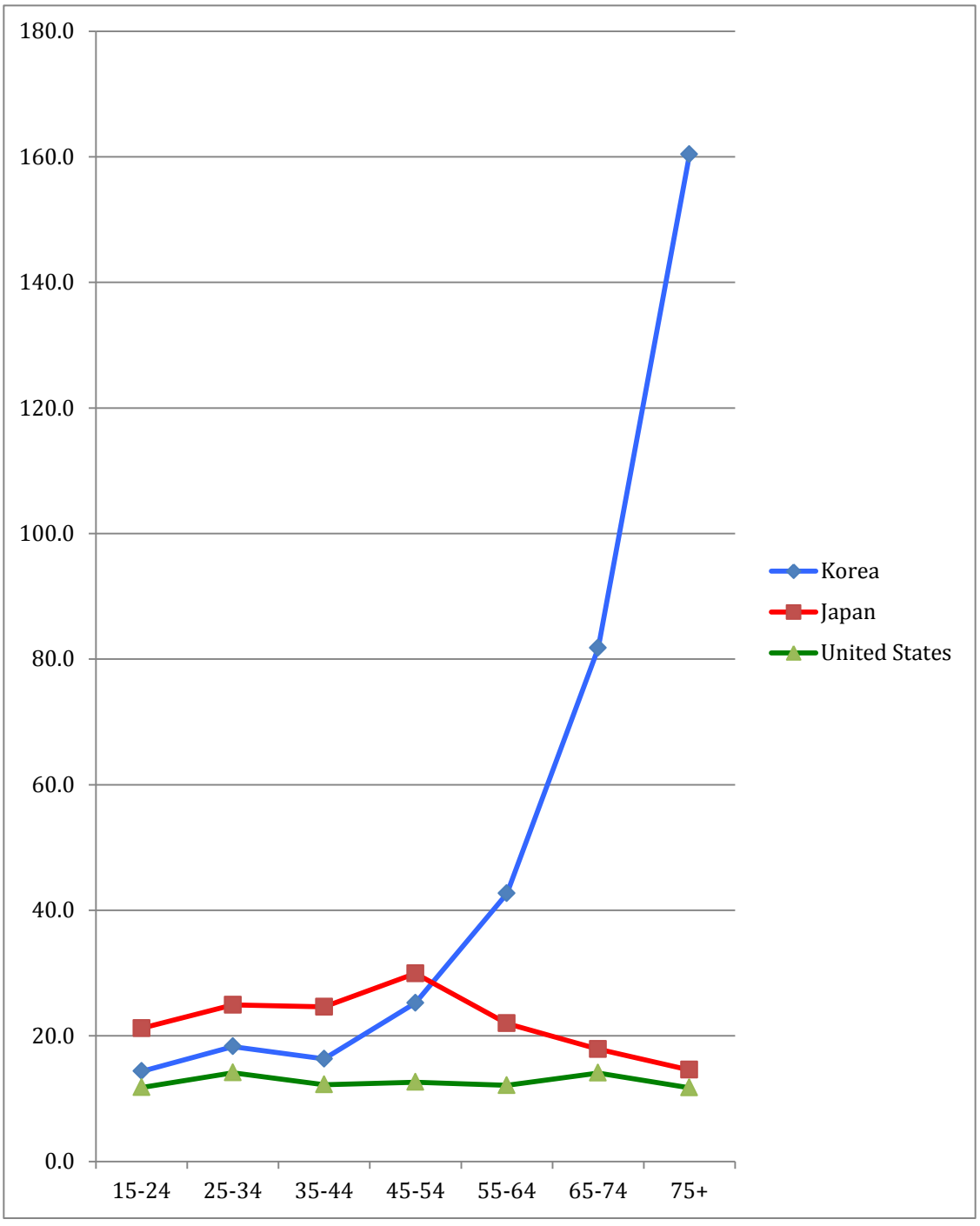
SOURCE: KOSIS 2013.

Figure 2. Population Pyramid of South Korea, 2050
(in thousands)



SOURCE: KOSIS 2013.

Figure 3. Age-specific death rates (per 100,000) for suicide in South Korea, Japan, and the United States: 2008



SOURCE: OECD 2009.

Figure 4.

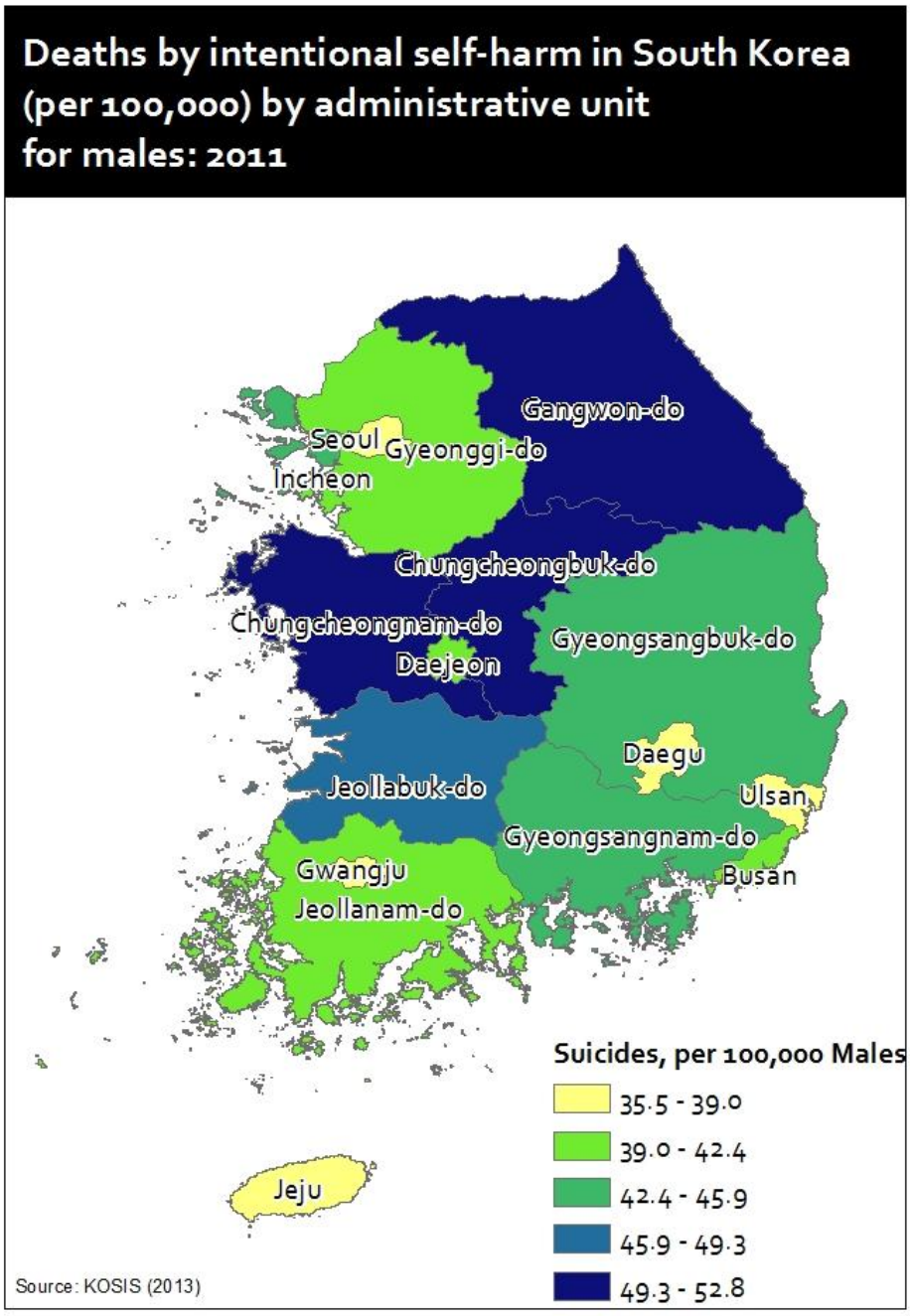

Deaths by intentional self-harm in South Korea (per 100,000) by administrative unit for males: 2011
Gangwon-do
Seoul
Gyeonggi-do
Incheon
Chungcheongbuk-do
Chungcheongnam-do
Daejeon
Gyeongsangbuk-do
Daegu
Jeollabuk-do
Ulsan
Gyeongsangnam-do
Gwangju
Busan
Jeollanam-do
Jeju
Suicides, per 100,000 Males
35.5 - 39.0
39.0 - 42.4
42.4 - 45.9
45.9 - 49.3
49.3 - 52.8
Source: KOSIS (2013)

Figure 5.

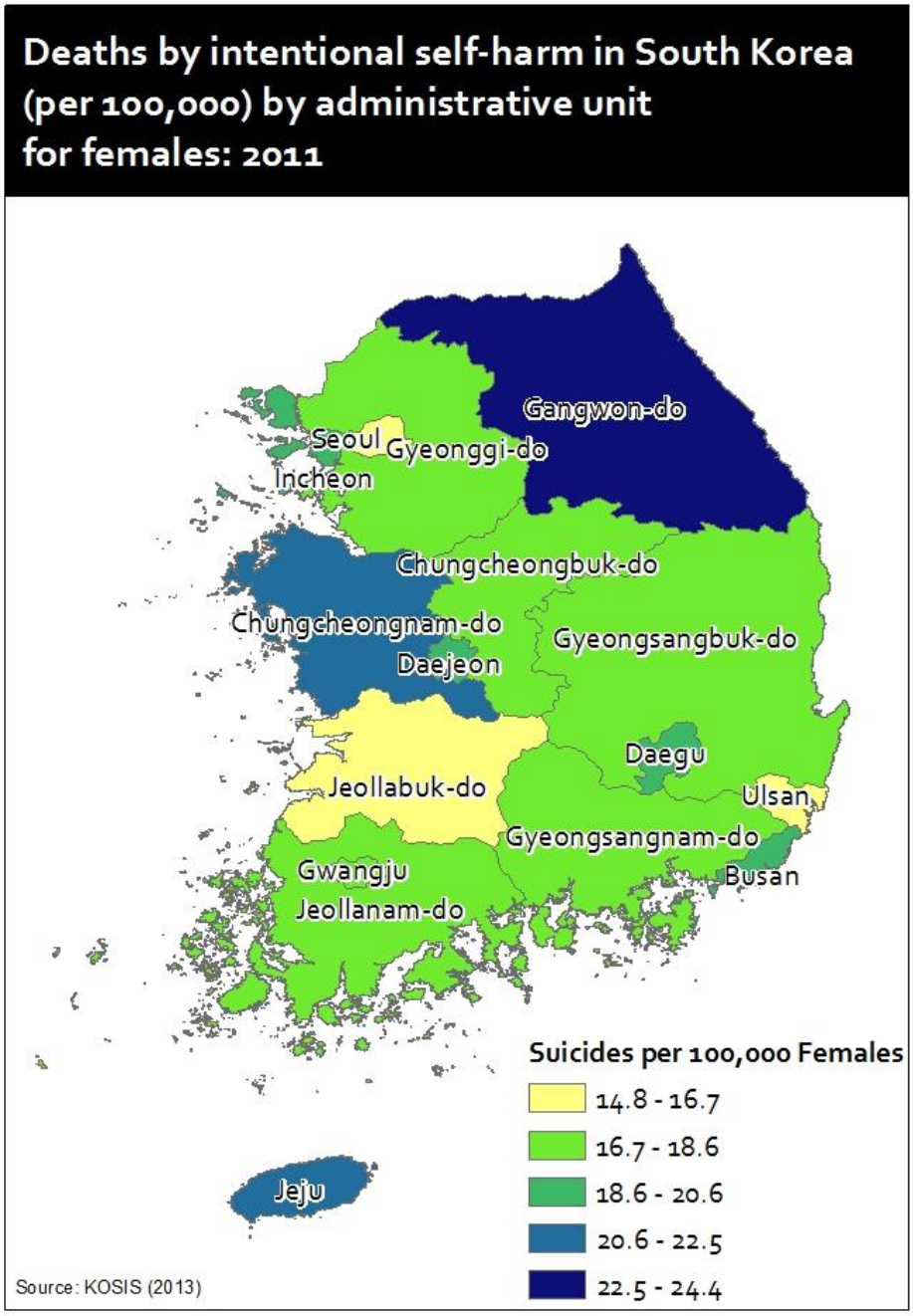

Deaths by intentional self-harm in South Korea (per 100,000) by administrative unit for females: 2011
Gangwon-do
Seoul
Gyeonggi-do
Incheon
Chungcheongbuk-do
Chungcheongnam-do
Daejeon
Gyeongsangbuk-do
Daegu
Jeollabuk-do
Ulsan
Gyeongsangnam-do
Gwangju
Busan
Jeollanam-do
Jeju
Suicides per 100,000 Females
14.8 - 16.7
16.7 - 18.6
18.6 - 20.6
20.6 - 22.5
22.5 - 24.4
Source: KOSIS (2013)

Figure 6.

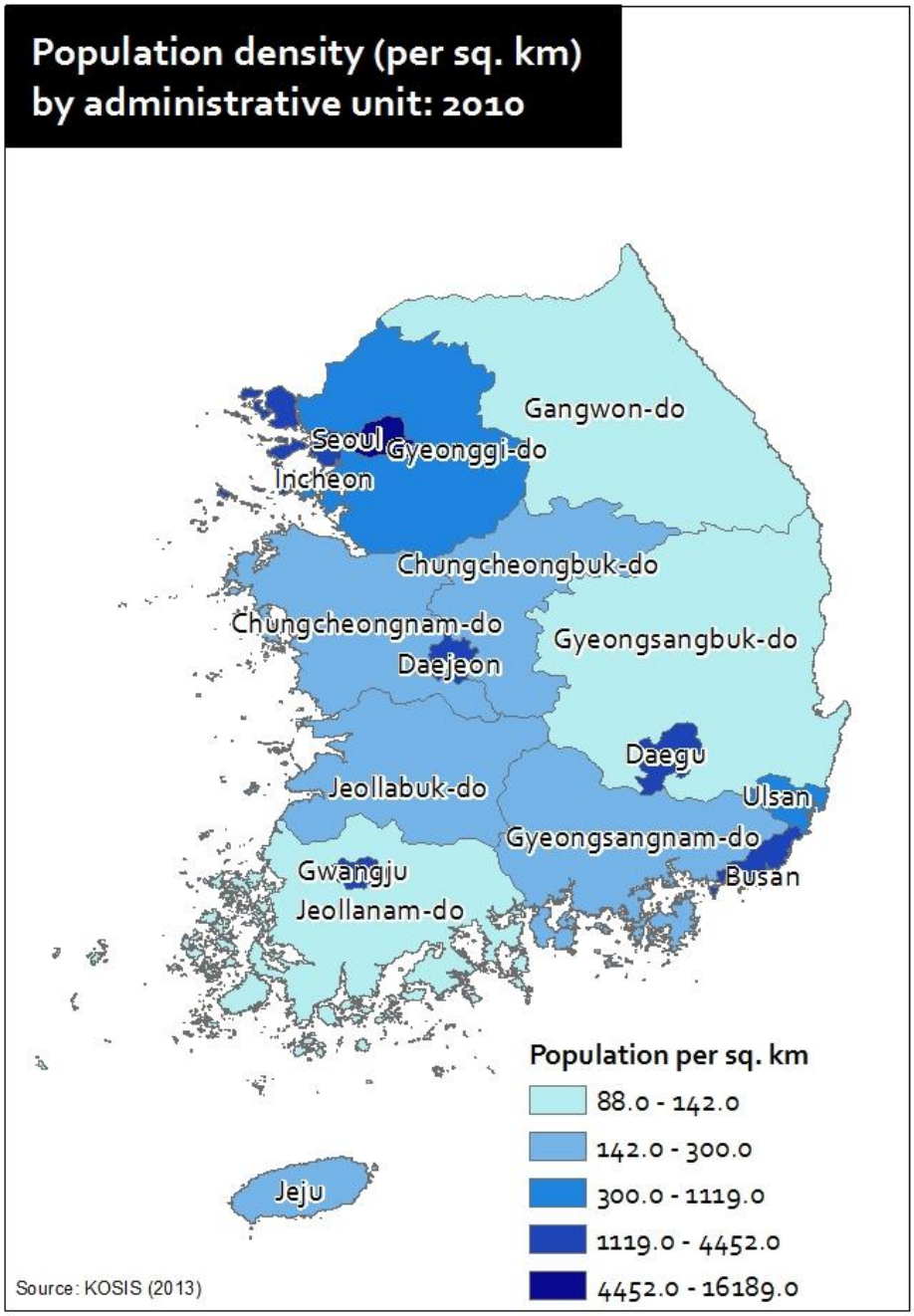

Population density (per sq. km) by administrative unit: 2010
Gangwon-do
Seoul
Gyeonggi-do
Incheon
Chungcheongbuk-do
Chungcheongnam-do
Daejeon
Gyeongsangbuk-do
Daegu
Jeollabuk-do
Ulsan
Gyeongsangnam-do
Busan
Gwangju
Jeollanam-do
Jeju
Population per sq. km
88.0 - 142.0
142.0 - 300.0
300.0 - 1119.0
1119.0 - 4452.0
4452.0 - 16189.0
Source: KOSIS (2013)

Table 1. Deaths by intentional self-harm in South Korea (per 100,000) and population density, by administrative unit: 2011

	Deaths by intentional self harm per 100,000			Density (per sq. km)
	Total	Males	Females	
Total	28.8	41.1	17.9	486
Special Cities				
Seoul	24.6	35.5	14.8	16,189
Metropolitan Cities				
Busan	28.6	39.4	19.1	4452
Daegu	27.5	36.1	20.2	2767
Incheon	31.2	43.1	20.2	2588
Gwangju	26.1	36.0	16.9	2946
Daejeon	29.0	39.7	19.0	2781
Ulsan	25.5	36.6	16.4	1022
Provinces				
Gyeonggi-do	29.2	41.5	18.4	1119
Gwangwon-do	37.7	52.8	24.4	88
Chungcheongbuk-do	33.6	50.5	18.6	203
Chungcheongnam-do	36.5	52.5	22.0	235
Jeollabuk-do	31.6	49.3	15.4	220
Jeollnam-do	27.8	39.3	16.9	142
Gyeongsangbuk-do	30.0	43.3	17.5	137
Gyeongsangnam-do	29.2	42.5	17.7	300
Special self-governing province				
Jeju-do	28.5	38.1	21.3	288

SOURCE: KOSIS 2013

Table 2. Sample characteristics of the Korean Longitudinal Sample of Aging sample used in this analysis: 2006

Variable	**Percentage**
Aged 65-74	64.9
Female	57.7
Live in a city	51.4
Currently married	63.2
High school or more	19.7
Have at least one child	97.5
Do not receive aid from any child	25.0
Co-reside with a child	8.4
Currently work	15.0
Fair or poor general health	70.3
Assets (below mean of 11,709,000 won)	48.0
Income is below mean (769,000 won)	63.2
No friends or family	14.2
No group participation	39.2
Self-report of depression	15.7
Medical report of depression	44.4
N	3518

SOURCE: KLOSA 2007.

Table 3. Adjusted odds ratios and confidence intervals for depression among South Korean elderly aged 65 and over: 2006

Characteristic	Self-report of depression, Model 1	Medical report of depression, Model 1	Self-report of depression, Model 2	Medical report of depression, Model 2
Aged 65-74	1.14 (0.93-1.41)	0.99 (0.84-1.16)	1.15 (0.93-1.41)	0.99 (0.84-1.16)
Female	1.19 (0.93-1.51)	1.04 (0.87-1.24)	1.19 (0.93 -1.51)	1.04 (0.87-1.24)
Live in a city	0.90 (0.74-1.09)	0.80 (0.69-0.92)**	0.90 (0.74-1.09)	0.80 (0.69-0.93)*
Currently married	0.56 (0.45-0.69)**	0.57 (0.48-0.68)**	0.56 (0.45-0.69)**	0.57 (0.48-0.67)**
High school or more	0.85 (0.63-1.16)*	0.54 (0.43-0.67)**	0.85 (0.63-1.16)	0.54 (0.44-0.67)**
Have at least one child	1.07 (0.61-1.86)	0.75 (0.43-1.29)	--	--
Receive aid from at least one child	1.33 (1.05-1.67)	1.13 (0.94-1.36)	--	--
Co-reside with a child	0.70 (0.46-1.08)	0.99 (0.72-1.37)	--	--
Currently work	0.81 (0.59-1.11)	0.84 (0.67-1.04)	0.89 (0.64-1.22)	0.92 (0.74-1.16)
Fair or poor health	3.43 (2.59-4.54)**	3.28 (2.76-3.89)**	3.23 (2.44-4.28)**	3.15 (2.65-3.75)**
Assets	--	--	1.04 (0.86-1.26)	1.01 (0.87-1.17)
Poverty	--	--	1.23 (1.00-1.53)	1.28 (1.10-1.50)*
Friend	--	--	1.35 (1.04-1.75)*	1.29 (1.04-1.61)*
Group	--	--	1.41(1.15)-1.73)**	1.49 (1.28-1.75)**
N	3516	3488	3516	3488
Log-likelihood	-1431.37**	-2171.99**	-1420.84**	-2147.71**

$p < .05$
$p<.001$

SOURCE: KLOSA 2007.