

# Policy Measures That Can Help Resolve the Problem of Low Fertility Rate in South Korea: Using Artificial Intelligence<sup>1</sup>

Park, Choon Yup (朴春燁)

Professor Emeritus, Dongguk University(東國大學校), Seoul, Korea, [choonpark@naver.com](mailto:choonpark@naver.com)

Park, Alexandra J.

Sanofi-aventis Korea Co., Seoul, Korea

## I. Introduction

The purpose of this paper is to propose various measures that can presumably help resolve the problem of low fertility rate<sup>2</sup> in South Korea. With this purpose in mind, this paper first identifies the causes of the of the low fertility rate in South Korea. Secondly, for each category of these causes, this paper suggests various policy measures that are assumed to help resolve the specific problems. In this process of identification of problems and development of the specific measures, this paper relies heavily on the artificial intelligence including ChatGPT, Bard, and Bing. This paper may be one of the first research outcomes about the fertility rate in South Korea that makes use of AI or Artificial Intelligence.

This paper is not intended to compare the low fertility problem of South Korea with that of Japan. However, since this paper is presented in Yokohama, Japan, brief comparative comments of the fertility rates of Japan are included. Regarding appropriateness of this paper in this conference, this paper dealing with the problem of population may be an acceptable topic of interest in this conference of Japanese-Korean economy and management because the problem of population is closely related to economics and business of a country. This is why author of this paper dare to present this article in this conference.

## II. Background

---

<sup>1</sup> This article is presented in the 38th International Conference on Japanese-Korean Economy and Management, Yokohama, Japan, August 25, 2023.

<sup>2</sup> The **birth rate** is the total number of births in a year per 1,000 individuals in a population while **fertility rate** is the number of live births in a year per 1,000 women of reproductive age in a population.

For the purpose of better comprehension of the contents presented in this paper, a brief background of the problem of low fertility rate in South Korea will be introduced. South Korea marked a fertility rate of 0.78 in 2022, which is the lowest in the world.

There are many warnings regarding the decreasing fertility rate of South Korea. One of such warnings is the one by David Coleman in 2006 who was a population expert and demographer at the Oxford Centre for Population Research. He warned that South Korea could become the first country on the planet to lose its entire population because of its low birthrate.

Comparing with fertility rate of Japan, South Korea's rate is lower than that of Japan, declining faster (See Table 1).

Recently South Korea has taken various measures to resolve the problem of low fertility rate in the nation. However, there is little sign that the problem of low fertility rate would upturn. According to government of South Korea announcement, huge amount of money has been allocated to resolve the problem of low fertility rate.

There have been many research papers and books, and policy measures suggesting policies presumably effective to increasing fertility rate of South Korea. However, the results do not show any indication to change the decreasing trend. This paper may be one of the first research papers about the fertility rate in South Korea that make use of Artificial Intelligence.

**Table 1.. Yearly Fertility Rates of South Korea and Japan**

Year	Japan(A)	South Korea(B)	Difference A-B
2006	1.32	1.132	0.188
2007	1.34	1.259	0.081
2008	1.37	1.192	0.178
2009	1.37	1.149	0.221
2010	1.39	1.226	0.164
2011	1.39	1.244	0.146
2012	1.41	1.297	0.113
2013	1.43	1.187	0.243
2014	1.42	1.205	0.215
2015	1.45	1.239	0.211
2016	1.44	1.172	0.268
2017	1.43	1.052	0.378
2018	1.42	0.977	0.443
2019	1.36	0.918	0.442
2020	1.34	0.837	0.503
2021	1.3	0.81	0.49
2022	<a href="#">1.26</a>	0.78	0.48

Sources of Data: Wikipedia

### III. Causes of Low Fertility Rate in South Korea

The causes of low fertility rate in South Korea may be many and diverse. One of the first steps to resolve the problem is to identify causes the problem. In order to identify causes of low fertility rate in South Korea, author of this paper asked artificial intelligence ChatGPT to identify those causes. The result is ones given below with brief explanation for each of the causes. However, relative importance of each of the causes is hard to determine.

#### 3.1 High Cost of Raising Children

The financial burden associated with raising children in South Korea is considered one of the main deterrents to starting a family. Expenses related to education, housing, healthcare, and

extracurricular activities can be substantial, causing many couples to postpone or limit childbearing.

### **3.2 Housing Affordability and Limited Space**

The high cost of housing, particularly in major cities like Seoul, makes it difficult for couples to afford larger homes suitable for raising children. Limited living space, combined with societal expectations for separate bedrooms for each child, adds to the challenges of starting or expanding families.

### **3.3 Limited Work-life Balance**

Long working hours and a demanding work culture in South Korea often leave little time for individuals to start or expand their families. The competitive nature of the job market and the lack of adequate support for working parents, such as parental leave and affordable childcare options, contribute to the decision to delay or forego having children.

### **3.4 Gender Inequality and Traditional Gender Roles**

Despite progress in women's rights and gender equality, South Korea still faces deep-rooted gender stereotypes and traditional roles within the family. The expectation that women will primarily assume caregiving responsibilities often conflicts with their career aspirations, leading some women to delay or avoid childbirth altogether.

### **3.5 Health and Medical Support**

Some couples in South Korea are unable to have children due to health problems. This can be due to infertility, genetic disorder, or other health issues.

### **3.6 Lack of Integrated Office That Handles Comprehensive Family-friendly Policies**

While South Korea has implemented various policies to address the low birth rate, such as providing financial incentives, extending parental leave, and improving childcare services, some argue that these measures are insufficient. The need for more comprehensive and accessible family-friendly policies, including affordable and high-quality childcare, flexible work arrangements, and support for working parents, remains a pressing issue.

It is important to note that the relative importance of these factors may vary among individuals and communities, and they often interact with and reinforce each other. Addressing the low birth rate requires a multifaceted approach that considers these complex factors holistically.

## **IV. Measures That May Resolve the Causes of Low Fertility Rate**

### **4.1 Measures for Reducing High Cost of Raising Children**

- 1) **Childcare subsidies:** Provide financial assistance to families to help cover the cost of childcare expenses.
- 2) **Education support:** Implement policies that offer free or reduced-cost education materials, such as textbooks and school supplies.
- 3) **Tax incentives:** Introduce tax breaks or credits specifically targeted at families with children to alleviate financial burdens.
- 4) **Affordable housing:** Develop affordable housing options for families, including rental subsidies or low-interest loans.
- 5) **Maternity and paternity leave:** Enhance parental leave policies, providing longer periods of paid leave for both mothers and fathers.
- 6) **Flexible work arrangements:** Encourage employers to offer flexible work hours or telecommuting options, allowing parents to balance work and childcare responsibilities.
- 7) **Support for single parents:** Establish programs that provide financial aid and resources to single parents, including affordable childcare options.
- 8) **Healthcare assistance:** Ensure accessible and affordable healthcare services for children, including preventive care, vaccinations, and medical treatments.
- 9) **Nutrition programs:** Implement initiatives that offer nutritious meals or food assistance programs for children, especially in low-income families.
- 10) **Support for early childhood development:** Establish early childhood education programs that are accessible and affordable for all families.
- 11) **Subsidized extracurricular activities:** Provide subsidies for children's extracurricular activities, such as sports, arts, and music lessons.
- 12) **Community centers:** Establish community centers that offer free or low-cost activities, educational resources, and support services for families with children.
- 13) **Financial literacy programs:** Develop programs that educate parents on budgeting, financial planning, and smart money management strategies.
- 14) **Affordable healthcare insurance:** Implement policies to ensure affordable health insurance coverage for children, reducing medical expenses for families.
- 15) **Public transportation discounts:** Offer reduced fares or discounted transportation passes for families with children to alleviate commuting costs.
- 16) **School meal programs:** Expand school meal programs to provide nutritious meals for children at a reduced cost or for free.
- 17) **Scholarships and grants:** Increase the availability of scholarships and grants for higher education to alleviate the long-term financial burden on families.
- 18) **Collaborations with businesses:** Encourage businesses to offer family-friendly policies, such as on-site daycare facilities or subsidies for employees with children.
- 19) **Affordable internet access:** Ensure affordable and reliable internet access in all households to facilitate online education and reduce education-related costs.
- 20) **Financial aid for college education:** Establish financial aid programs or loan

forgiveness initiatives to support families in covering the costs of college education for their children.

#### 4.2 Measures for Improving Housing Affordability and Limited Space

Addressing housing problems in South Korea can contribute to resolving the issue of the low birth rate. Here are some policy ideas, social practices, and financial measures that can help.

- 1) **Increase affordable housing supply:** Implement policies and incentives to increase the supply of affordable housing, particularly for young couples and families. This can include government subsidies, tax incentives, and land allocation for affordable housing projects.
- 2) **Develop family-friendly housing options:** Encourage the development of housing options that cater specifically to the needs of families, such as larger units with appropriate amenities and child-friendly infrastructure. This can help create a more conducive environment for raising children
- 3) **Provide financial assistance for housing:** Introduce financial measures to support couples and families in securing housing, such as low-interest loans, down payment assistance programs, and housing grants. These measures can help alleviate the financial burden of acquiring a home, making it more feasible for couples to start or expand their
- 4) **Review and revise housing regulations:** Evaluate existing housing regulations and zoning laws to identify any barriers or restrictions that hinder the availability of affordable housing. Streamlining regulations and promoting flexible land use policies can facilitate the development of more affordable housing options.
- 5) **Encourage mixed-use development:** Promote the development of mixed-use neighborhoods that combine residential, commercial, and community facilities. This approach can create vibrant and sustainable communities, providing easier access to amenities and services that are essential for families.
- 6) **Enhance public transportation infrastructure:** Improve public transportation networks and connectivity, particularly in suburban areas. This can reduce commuting time and make living in affordable housing outside city centers more viable for families, improving their quality of life and encouraging them to consider having children.
- 7) **Support cooperative housing models:** Foster cooperative housing models, such as housing cooperatives or community land trusts, where residents collectively own and manage housing units. These models can provide more affordable and stable housing options while fostering a sense of community and social support.
- 8) **Promote sustainable urban planning:** Implement sustainable urban planning practices that prioritize compact, walkable neighborhoods with access to green spaces, schools, healthcare facilities, and other essential amenities. Creating livable, well-designed communities can attract families and support their decision to have children.
- 9) **Encourage intergenerational housing:** Facilitate the development of intergenerational housing options that bring together different age groups within the same community or housing complex. This can foster social connections, support

systems, and opportunities for the exchange of knowledge and experiences between generations.

- 10) Raise public awareness and challenge housing stereotypes:** Conduct public awareness campaigns to challenge stereotypes and prejudices associated with housing choices. Promote the idea that diverse housing options, including affordable and family-friendly housing, are essential for a healthy and vibrant society.

It's important to note that addressing the housing problem and the low birth rate in South Korea requires a comprehensive and multi-dimensional approach involving collaboration between the government, private sector, and civil society. These policy ideas, social practices, and financial measures can contribute to creating a more supportive housing environment for families, potentially encouraging them to have children and addressing the low birth rate issue.

### 4.3 Measures for Improving Limited Work-life Balance

Improving work-life balance is indeed crucial for addressing the low birth rate issue in South Korea. Here are some policy ideas, measures, and support that can help improve work-life balance and encourage couples to have more children.

- 1) Flexible working arrangements:** Introduce policies that promote flexible work hours, remote work options, and part-time employment. This will allow parents to better balance their work responsibilities with childcare and household duties.
- 2) Parental leave and benefits:** Enhance parental leave policies by extending the duration and increasing the wage replacement rate. Consider implementing dedicated paternity leave to encourage fathers to take an active role in childcare. Additionally, provide financial incentives such as childcare subsidies or tax credits for families with young children.
- 3) Affordable and accessible childcare:** Increase the availability and affordability of quality childcare facilities, including daycare centers, nurseries, and preschools. Invest in expanding the capacity of these facilities and provide subsidies for low-income families to ensure access for all.
- 4) Work-hour regulation:** Implement stricter regulations on maximum working hours to prevent overwork and promote a healthy work-life balance. Encourage companies to establish clear guidelines and policies to reduce overtime and create a culture that values work-life balance.
- 5) Work culture reform:** Raise awareness about the importance of work-life balance through public campaigns and education programs. Encourage employers to foster a supportive work culture that respects employees' personal lives, discourages excessive overtime, and promotes well-being.
- 6) Support for work-life integration:** Offer programs that support employees in integrating work and family responsibilities, such as on-site or nearby childcare facilities, flexible break times for breastfeeding, and support for employees with eldercare responsibilities.

- 7) **Affordable housing:** Address the high cost of housing, which often places an additional burden on couples considering starting a family. Implement policies to increase the supply of affordable housing options and provide financial assistance or tax incentives for first-time homebuyers.
- 8) **Financial assistance for childcare:** Provide financial support for childcare expenses, such as subsidies, vouchers, or tax credits, to ease the financial burden on families and encourage them to have more children.
- 9) **Workplace initiatives:** Encourage companies to adopt family-friendly policies, such as on-site daycare facilities, lactation rooms, and employee assistance programs that support work-life balance. Recognize and reward companies that excel in implementing such initiatives.
- 10) **Education and awareness:** Promote comprehensive sex education and family planning programs to empower individuals and couples with the knowledge and resources needed to make informed decisions about family planning.
- 11) **Support for single parents:** Enhance support systems for single parents, including access to affordable childcare, financial assistance, and career development opportunities, to alleviate the challenges they face and encourage their participation in the workforce.

It is important to note that implementing these policies and measures requires collaboration between the government, employers, and civil society organizations. By creating an environment that values work-life balance and supports the needs of working parents, South Korea can foster an atmosphere conducive to raising the country's birth rate.

#### **4.4 Measures for Reducing Gender Inequality and Traditional Gender Roles**

Addressing gender inequality and the low birth rate in South Korea requires a comprehensive approach that encompasses various policy ideas, social practices, and workplace practices. Here are some suggestions that can help reduce gender inequality and promote a better work-life balance, thus potentially contributing to addressing the low birth rate issue:

- 1) **Implement comprehensive parental leave policies:** Introduce and enforce policies that provide adequate and flexible parental leave for both mothers and fathers. This would encourage fathers to take an active role in childcare, reducing the burden on mothers and promoting gender equality in parenting responsibilities.
- 2) **Improve access to affordable childcare:** Expand the availability and affordability of quality childcare facilities and services. This would enable both parents to continue their careers while ensuring that children receive proper care and education, thus alleviating the concerns of couples regarding balancing work and family life.
- 3) **Promote gender equality in the workplace:** Encourage equal opportunities for women in the workforce by implementing policies that address pay gaps, promote women's leadership, and reduce workplace discrimination. This would create a more

inclusive and supportive work environment for women, encouraging them to pursue both their careers and family aspirations.

- 4) **Offer flexible work arrangements:** Encourage employers to provide flexible work options such as remote work, flexitime, compressed workweeks, and job-sharing. These arrangements can help individuals better balance their work and personal lives, including childcare responsibilities, thereby reducing the barriers to starting or expanding families.
- 5) **Encourage shared household responsibilities:** Promote cultural and social practices that encourage the equal sharing of household chores and responsibilities between partners. This would reduce the burden on women and foster a more equitable division of labor within the home, enabling both partners to actively participate in parenting and family life.
- 6) **Enhance access to reproductive healthcare:** Improve access to affordable and comprehensive reproductive healthcare services, including family planning, fertility treatments, and prenatal care. This would empower individuals and couples to make informed decisions about their reproductive choices, including the timing and number of children.
- 7) **Foster gender-sensitive education:** Promote gender equality and challenge gender stereotypes through educational initiatives at all levels. This would help dismantle traditional gender roles and promote more equal opportunities for both girls and boys, fostering a culture of gender equality from an early age.
- 8) **Raise awareness and combat gender bias:** Conduct public awareness campaigns to challenge gender biases and stereotypes, both at home and in the workplace. These campaigns can help reshape societal attitudes, promoting a more inclusive and egalitarian view of gender roles and responsibilities.
- 9) **Encourage male participation in household tasks and childcare:** Launch targeted initiatives that promote and celebrate male involvement in household tasks and childcare responsibilities. This can help change societal norms and expectations around gender roles, making it more acceptable for men to take on caregiving roles and contribute to the upbringing of children.
- 10) **Support women's career progression:** Create programs and initiatives that support women's career development, including mentoring programs, networking opportunities, and leadership training. By providing the necessary support and resources, women can overcome barriers and achieve professional success, making it easier for them to balance work and family life.

These policy ideas, social practices, and workplace practices, if implemented effectively, can contribute to reducing gender inequality and address the low birth rate issue in South Korea. It is important to recognize that these measures should be part of a broader strategy involving collaboration between government, employers, civil society organizations, and individuals to create a more gender-equal and family-friendly society.



## 4.5 Measures for Health and Medical Support

To support young families and young people in health and medical issues and promote an increase in the birth rate in South Korea, various methods, measures, policies, and ways can be implemented. Here are some examples:

- 1) **Enhanced prenatal care:** Expand access to quality prenatal care services, including regular check-ups, screenings, and educational programs for expectant mothers and fathers.
- 2) **Maternity and paternity leave:** Establish and enforce policies that provide adequate maternity and paternity leave, allowing parents to take time off work to care for their newborns without fear of losing their jobs.
- 3) **Subsidized child care:** Increase the availability and affordability of high-quality child care facilities, offering financial assistance or subsidies to low-income families and young parents.
- 4) **Parenting education and support programs:** Develop and implement programs that provide comprehensive parenting education and support, covering topics such as infant care, nutrition, early childhood development, and effective parenting techniques.
- 5) **Financial incentives:** Introduce financial incentives, such as tax benefits or cash bonuses, to encourage young couples to have children and alleviate the financial burden associated with raising a family.
- 6) **Housing support:** Facilitate affordable housing options specifically designed for young families, offering subsidies or low-interest loans to help them acquire suitable housing.
- 7) **Health insurance coverage:** Ensure that health insurance policies cover maternity care, childbirth, and pediatric services, reducing out-of-pocket expenses for young families and encouraging them to seek necessary medical care.
- 8) **Mental health support:** Establish mental health services tailored to young parents, providing counseling, therapy, and support groups to address postpartum depression, stress, and other mental health challenges.
- 9) **School education:** Incorporate comprehensive sex education into school curricula to educate young people about reproductive health, contraception, and family planning, enabling them to make informed decisions about their future.
- 10) **Fertility treatments and assistance:** Make fertility treatments more accessible and affordable by expanding coverage under health insurance plans, offering grants or subsidies for assisted reproductive technologies, and establishing specialized fertility clinics.
- 11) **Work-life balance initiatives:** Encourage employers to implement flexible work arrangements, such as flexible hours or remote work options, to support the work-life balance of young parents.
- 12) **Community support networks:** Establish community-based support networks for

young families, providing a platform for social interaction, mutual support, and sharing of experiences.

- 13) **Public awareness campaigns:** Launch nationwide campaigns to raise awareness about the importance of family, childbearing, and the benefits of having children, aiming to reshape societal attitudes and reduce the stigma associated with parenthood.
- 14) **Research and data collection:** Conduct comprehensive research and collect data on the challenges faced by young families and young people in terms of health and medical issues, birth rates, and family planning to inform evidence-based policies and interventions.

These measures, when implemented collectively and supported by government, healthcare providers, employers, and communities, can contribute to improving the health and well-being of young families and young people and ultimately increase the birth rate in South Korea.

#### 4.6 Establish Government Agency for Comprehensive Family-friendly Policies

Establishing a dedicated agency, ministry, or office to handle the development and implementation of comprehensive family-friendly policies can be beneficial in addressing the issue of low birthrate in South Korea. Such an organization would centralize efforts, ensure focused attention on family-friendly policies, and streamline coordination among different stakeholders. Here's how it could be done:

- 1) **Legislative action:** The government would need to pass legislation to create the agency, ministry, or office responsible for family-friendly policies. This could involve amending existing laws or enacting new ones to define the scope, responsibilities, and powers of the organization.
- 2) **Resource allocation:** Adequate resources, both financial and human, would need to be allocated to the agency to effectively carry out its mandate. This would include budgetary provisions for research, policy development, program implementation, and monitoring and evaluation.
- 3) **Expertise and staffing:** The agency should recruit experts in fields such as demographics, sociology, economics, and public policy, who can analyze data, conduct research, and propose evidence-based solutions. Additionally, the agency would require staff members with diverse skills, including policy analysts, program managers, and communication specialists.
- 4) **Collaborative approach:** The agency should collaborate with various stakeholders, including government ministries, local authorities, employers, civil society organizations, and academic institutions. By fostering partnerships, the agency can benefit from diverse perspectives, leverage existing resources, and ensure coordinated efforts across different sectors.
- 5) **Policy development:** The agency would be responsible for formulating comprehensive family-friendly policies based on research, best practices, and input from relevant stakeholders. It should analyze the root causes of low birthrate, monitor societal trends, and identify gaps and barriers that hinder family formation and support.

- 6) **Implementation and monitoring:** The agency would oversee the implementation of family-friendly policies and programs, ensuring that they are effectively carried out across different sectors. It should establish monitoring mechanisms to assess the impact of policies, identify areas of improvement, and make necessary adjustments.
- 7) **Evaluation and feedback:** The agency should regularly evaluate the effectiveness of family-friendly policies, collecting data, conducting surveys, and seeking feedback from individuals and families. This feedback loop will provide insights into the success of implemented measures and guide future policy decisions.
- 8) **Public awareness and communication:** The agency should engage in public awareness campaigns to promote the importance of family-friendly policies and educate the public about available benefits and resources. Clear and effective communication channels should be established to disseminate information and encourage public participation.
- 9) **International cooperation:** The agency could collaborate with international organizations, research institutions, and governments of other countries facing similar challenges to share knowledge, exchange best practices, and learn from successful initiatives implemented elsewhere.

By establishing a dedicated agency, ministry, or office, South Korea can demonstrate its commitment to addressing the issue of low birthrate and create a centralized mechanism for developing and implementing comprehensive family-friendly policies. This approach can help ensure sustained focus, expertise, and accountability in efforts to reverse the declining birthrate trend.

## V. Concluding Remarks

This manuscript identifies six major causes of low fertility rate of South Korea. They are: 1. High Cost of Raising Children, 2. Housing Affordability and Limited Space, 3. Limited Work-life Balance, 4. Gender Inequality and Traditional Gender Roles, 5. Health and Medical Support, 6. Lack of Integrated Office That Handles Comprehensive Family-friendly Policies.

Under each of these categories of causes, specific measures that appear to be necessary to overcome the causes of low fertility rate are listed with brief illustration. These measures may not sufficient for resolving necessary and sufficient condition for resolving low fertility rate in South Korea. However, these are good starting point for now. The suggestions included in this paper are first ones made by Artificial Intelligence. Some of the suggestions from AI's in this article may be even fresh.

## Bibliography

Artificial Intelligence: ChatGPT, Bard, and Bing

Wikipedia