# Korean Longitudinal Survey of Women & Families : The 2022 Annual Report

Sun Mi Cho
Jae-seon Joo
Young-ran Kim
Dong-sun Lee
Eun-jeong Kim
Jin-sook Lee
Yeon-kyu Lim
Jeong-han Kang
Chang-kyoon Son

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## Ⅰ. Introduction

### 1. Motivation and Purpose of the Study

The KLoWF (Korean Longitudinal Survey of Women & Families) is a panel survey conducted by the KWDI (Korean Women's Development Institute) that focuses on fields relevant to women and families, such as the life and family structure of Korean women, family processes and family life, familial relationships and values, and changes in the realm of employment. The study has national coverage and tracks respondents longitudinally.

The 1$^{st}$ wave of the KLoWF study was conducted in 2007. Over nearly

17 years leading up to the present 2022, a total of 8 waves worth of data has been compiled. As of 2022, the 9$^{th}$ wave study is currently under way. In an age of demographic shifts such as low fertility and population aging alongside family diversity, The KLoWF data helps characterize the current state of Korean society. Looking at how various spheres of life are interconnected, as well as identifying the factors driving them, will give policymakers a better future outlook on issues to focus on.

## 2. Study Contents and Methodology

### A. Overview of Key Outcomes from 2006~2021

Throughout 2006~2021, the KLoWF team has conducted various research regarding the collection, compilation, and management of panel data. Following a pilot study that was conducted during 2006~2007, the 1$^{st}$ wave study was conducted in 2007. Thereafter, the main survey was administered biennially, with the 2$^{nd}$ wave in 2008 up to the 8$^{th}$ wave in 2020. In response to attrition in the panel sample, various efforts to maintain representativeness were taken including the addition of new samples, interim fieldwork, and other retention-related measures.

Some of the key outcomes of the study were as follows. First, the team conducted various projects related to the provision and open access services of the panel data. Data from new waves were released biennially, with the latest 8$^{th}$ wave data being made open to the public in March, 2022. Standardization and data cleaning efforts are conducted annually, and documentation is provided in Korean and English to promote the utilization of public data.

Second, reports were published regarding the outcomes of the panel study. These annual reports include both summary and in-depth analyses

on the panel data collected.

Third, the team has pursued various efforts to promote and share the surveyed data. From 2008 to 2020, data users' conferences and graduate students' competitions for papers utilizing the KLoWF data were held. During 2009~2021, academic symposiums for expert users were held. Additionally, panel forums and open working paper competitions were organized.

## B. Survey Contents in 2022

The key contents of the 2022 survey are as follows.

First, the $9^{th}$ wave main survey ($1^{st}$ half) was conducted. The $9^{th}$ wave main survey consists of the $1^{st}$ half in 2022 and the $2^{nd}$ half in 2023. In the $9^{th}$ wave study, new questionnaires were developed for the following three additional surveys: 1)family diversity 2)views on work-life balance 3)changes in women's lives due to COVID-19.

Second, data from the $1^{st}$~$8^{th}$ (2007~2020) waves were compiled and made available to users. Longitudinal data cleaning covering waves 1~8 was conducted, and data was standardized across items and waves before being made open to the general public via the KWDI website.

Third, the 2022 KLoWF acadeimic conference and graduate students' competition for papers was held. Sessions were organized into 'Changes in women's lives due to COVID-19', 'Women's working life and work-life balance', 'Women's life and health', and 'Women's life process and family', where relevant papers were presented and shared. Additionally, a special session on 'Panel Data: Development process and outcomes' was held, with a focus on boosting the panel data utilization in both quality and quantity, as well as considering ways for further

improvement.

Fourth, summary and in-depth analyses were conducted on the waves 1~8 data. The summary analysis looked at longitudinal trends of items in various categories such as general respondent characteristics, women's lives, and women's economic activity.

Fifth, the team reviewed the panel study's data quality and checked for avenues of improvement. The review included topics such as sample attrition, data composition and provision, consistency of responses, and the validity of the panel samples. Tasks for improvement were explored over both the short run and the mid/long run.

Furthermore, various other efforts regarding data maintenance/ management and user services were conducted. This includes the management of a bilingual website, publication of English-language reports, provision of KOSIS statistics tables, and other measures for improving data accessibility and usability such as providing survey findings as public data.

# Ⅱ. Overview of the 2022 Study

## 1. Overview of the 9th Wave KLoWF

### A. Subjects of the Survey

The subjects of the 9th wave survey are as follows. Subjects who are part of the 2007 original panel include 1) 12,240 individuals in 9,828 households nationwide who were surveyed across the 1st ~ 8th waves, 2) eligible female household members between ages 19~64 who either joined a sample household or reached age 19, as well as eligible

household members who formed split-off households.

The 2017 additional panel, which was added in the 6$^{th}$ wave, includes 2,130 households nationwide who were surveyed up to the 8$^{th}$ wave and the split-off households that were formed during the 9$^{th}$ wave. Eligible female household members include 1) 2,662 individuals from the 2017 panel and new household members between ages 19~64 who either joined a sample household or reached age 19, and 2) eligible household members who joined the sample due to household split-off.

〈Table 1〉 Subjects of the 9$^{th}$ Wave Survey

| Survey subjects | 2007 Original Panel | 2017 Additional Panel |
|---|---|---|
| Households | 9,828 households + split-off households in 9$^{th}$ wave | 2,130 households + split-off households in 9$^{th}$ wave |
| Eligible Household members | 12,240 persons + eligible HH members in 9$^{th}$ wave split-off households + HH members who reached age 19 + eligible HH members who joined a sample household | 2,662 persons + eligible HH members in 9$^{th}$ wave split-off households + HH members who reached age 19 + eligible HH members who joined a sample household |

## B. Sampling and Survey Methods

The sampling method employed by KLoWF is as follows. For the primary sampling units (PSU), 1,700 enumeration districts (ED) were selected from among those of the 2005 Population and Housing Census by applying probability proportional to size (PPS) sampling, where EDs were stratified by city and by province depending on the extent of urbanization, composition of workers by industry, composition of households by housing type, the distribution of households by household size, and the gender/age of the heads of households. Systematic sampling was applied to households residing within these 1,700 EDs for inclusion

in the sample. While 5 households were systematically sampled per ED for the purpose of surveying female household members, about 4~7 households were sampled per ED in the actual study.

Since the 8th wave, the data collection method has been tablet-assisted personal interview (TAPI).

## C. Retention Rate of Original Samples

The retention rate of original samples of the KLoWF is calculated based on the valid sample. The valid sample is what remains from the (9,068) original sample households after excluding those that were impossible to survey due to reasons such as deceased/missing, study abroad, long-term business trip, or illness and accidents, as well as those who wished to discontinue participation in the study.

As of the 8th wave, the original sample retention rates are as follows. Among the 2007 original sample households (9,068), interviews were attempted for 8,362 households after excluding 173 non-viable households and 533 households who wished to discontinue, with interviews being completed for 5,709 households (final valid retention rate of original sample=68.3%). Among the 2017 additional sample (2,049), interviews were attempted for 2,028 households after excluding 13 non-viable households and 8 households who wished to discontinue, with interviews being completed for 1,586 households (final valid retention rate of original sample=78.2%).

**Retention Rate of Original Sample Households**
(2007 Original Panel)
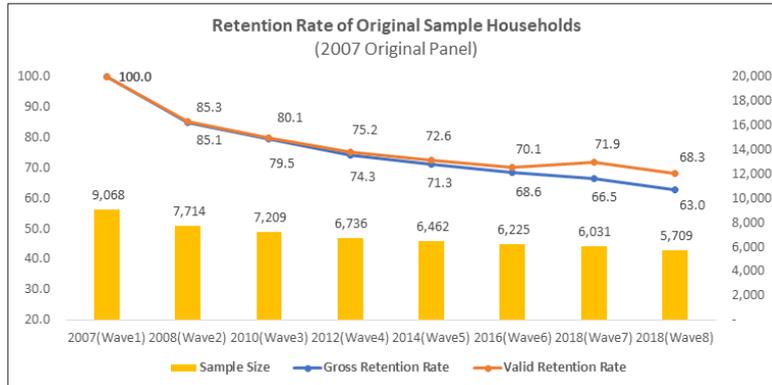
[Figure 1] Retention Rates, 2007 Original Sample Households



**Retention Rate of Original Sample Households**
(2017 Additional Panel)
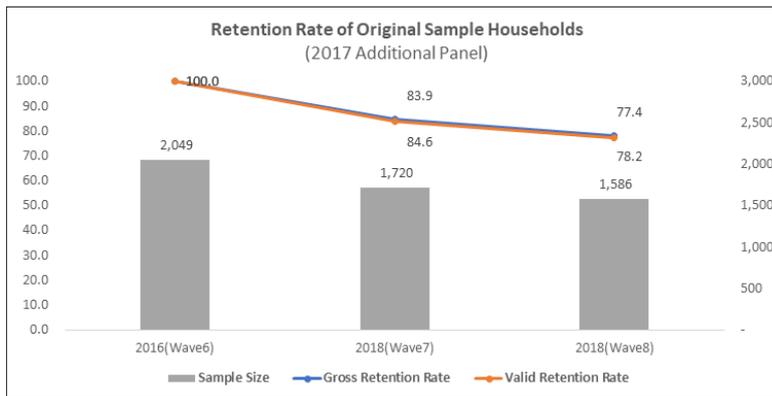
[Figure 2] Retention Rates, 2017 Additional Sample Households

## E. Composition of the 9th Wave Questionnaire

Questionnaires for the 9th wave main survey include those for households, individuals, and jobs. The Household Questionnaire includes items regarding housing status, household income, household consumption, and assets / debts. The Individual Questionnaire, comprising those for new and existing respondents, includes items regarding marriage history, domestic labor, child rearing, and health. The Jobs Questionnaire comprises those for new and existing jobs. For the

purpose of compiling job history data, the questionnaire has been restructured since the 3<sup>rd</sup> wave based on current job continuation. It includes various job-related items including job-seeking experiences, job satisfaction, education and training, and discrimination.

Additional questionnaires in the 9<sup>th</sup> wave include items regarding changes to family/women's lives due to COVID-19, receptiveness to diverse families, and views on work-life balance.

⟨Table 2⟩ Composition of the 9<sup>th</sup> wave KLoWF Questionnaire

| Questionnaires | | Topics |
|---|---|---|
| For households | | ① Household members and family, ② Housing status, ③ Household income, ④ Household spending, ⑤ Assets and debts ⑥ Changes in family lives due to COVID-19 (additional survey) |
| For Individuals | | ① School life, ② Marital status,<br>③ Unmarried women, ④ Marriage and marital life,<br>⑤ Domestic Labor, ⑥ Husband's job,<br>⑦ Couple living temporarily apart, ⑧ Separated, ⑨ Divorced,<br>⑩ Widowed,<br>⑪ Pregnancy and childbirth experience, and family planning,<br>⑫ Children's education [preschool children],<br>⑬ Children's education [primary and secondary school ages,<br>⑭ Relationship with unmarried adult children,<br>⑮ Relationship with married adult children,<br>⑯ Relationship with own parents,<br>⑰ Relationship with husband's parents, ⑱ Own siblings,<br>⑲ Husband's siblings,<br>⑳ Family-related values + (Additional) Receptiveness to family diversity<br>㉑ Health/leisure/life satisfaction |
| For Jobs | Jobs (basic) | ① Jobs held during the last survey<br>② Jobs still held since the last survey<br>  : wage workers, non-wage workers, workers in special forms of employment<br>③ Jobs left since the last survey<br>  : wage workers, non-wage workers, workers in special forms of employment<br>④ New jobs held since the last survey<br>⑤ New jobs still held since the last survey<br>  : wage workers, non-wage workers, workers in special forms of |

| Questionnaires | | Topics |
|---|---|---|
| | | employment<br>⑥ New jobs left since the last survey<br>　: wage workers, non-wage workers, workers in special forms of employment<br>⑦ Current economic activity |
| | Jobs (other) | ⑧ Job-search experience<br>⑨ Job satisfaction<br>⑩ Education and training<br>⑪ Social insurance<br>⑫ Work and family life<br>⑬ Discrimination<br>⑭ Maternity protection system |
| | Additio-nal | ⑮ (Additional) Working life and family life: views on work-life balance<br>⑯ (Additional) Changes in women's lives due to COVID-19 |

Note: <Table Ⅱ-2> from Joo et al. (2020), 'Korean Longitudinal Survey of Women & Families: the 2020 Annual Report', pp.30 amended by adding Additional Surveys conducted in the 9th wave

## 2. Summary of KLoWF Data Use Outcomes

### A. Comprehensive Review of Data Use

A comprehensive review of KLoWF data use from 2008 to July, 2022 showed that a total of 656 studies had utilized the survey's data. Here, we looked at 609 studies after discarding 47 studies where the data has not been verified or the data analysis results were not utilized. Starting with 31 studies in 2008, usage per year has grown steadily – peaking at 60 studies in 2020, followed by 56 studies in 2019 and 55 studies in 2014. By research topic, the most frequently studied area was economic activity (22.8%), followed by family (21.5%), childbirth/care (19.7%), health (18.2%), and work-life balance (14.9%).

## B. Use Frequency by Survey Area

The KLoWF survey covers a total of 56 research areas, including 31 areas in the Individual Questionnaire, 18 areas in the Jobs Questionnaire, 6 areas in the Household Questionnaire, and a common area used for tracking changes in overall respondents over the waves. Across 609 studies, a total of 16,370 items were utilized.

From the Individual Questionnaire, the most-utilized item was health and leisure activity satisfaction (1,962 cases), followed by family-related values (1,446 cases), domestic labor (1,393 cases), and marriage and marital life (937 cases). From the Jobs Questionnaire, the most-utilized item was work and family life (1,221 cases), followed by wage workers (1,141 cases) and job satisfaction (1,019 cases)

From the Household Questionnaire, sub-items of household income were the most-utilized (292 cases), while the section on assets and debts saw much use as well.

## C. Use Frequency by Item and Topic

Of the 56 total research areas, the 8 most-utilized areas accounted for 10,799 items, or 66.0% of all items. The most-utilized area was health and leisure activity satisfaction (12.0%), followed by individual characteristics (10.3%), family-related values (8.8%), domestic labor (8.5%), work and family life (7.5%), wage workers (7.0%), job satisfaction (6.2%), and marriage and marital life (5.7%).

# III. Summary Analysis

## 1. Changes in General Characteristics

### A. Socio-demographic Characteristics of Respondents

From the 2007 original panel, 9,997 individuals from the 9,068 respondent households of the 1st wave were surveyed. From the 2017 additional panel, 2,378 individuals from the 2,049 respondent households were surveyed. Thus, as of the 8th wave, a total of 9,175 individuals from 7,672 respondent households were included in the survey. As the study has matured over the past 8 waves, bringing several subsequent changes. These include a rise in the average years of schooling and a higher incidence of divorces or becoming widowed. Meanwhile, the share of attrition-prone demographics such as younger respondents and SMA(Seoul Metropolitan Area) residents has decreased. Furthermore, in the case of the 8th wave, an inquiry will be necessary regarding the possible acceleration of sample attrition due to the effects of COVID-19.

### B. Characteristics of Respondent Households

Looking at household member composition, 1-person households have grown steadily, surpassing 10% of all respondent households and accounting for 11.0% as of the 8th wave. This was closely followed by 2-person households in the 8th wave. Most 1-person households are the elderly - as of the 8th wave, the average age of 1-person households among respondents stood at 64.3 years. This appears to be attributable to separations and widowing due to the aging of panel respondents, as well as attrition among younger respondents. The regional distribution of respondent households resembles that of the individual respondents.

The share of respondents residing in the SMA and metropolitan cities decreased, while those residing in the provinces saw relative growth.

## 2. Changes in Household Characteristics

In terms of household economic status, there was a rise in both income and living expenses. Of the latter, food accounted for the largest portion of expenditure. The most frequent type of housing among KLoWF households was apartments, a tendency that has progressively intensified over the recent waves. In terms of housing arrangement, more than half of respondents reported being homeowners.

## 3. Changes in Women's Lives

### A. Incidence of Marriage

The share of women who have ever been married throughout their lifetime has been decreasing, while a growing number of women reported never being married. When asked about future intentions to marry, the share of currently unmarried respondents indicating in the affirmative dropped dramatically from 62.0% in the 3rd wave to 26.6% in the 8th wave. Meanwhile, the share of women who "never considered marriage" rose from 15.8% in 2010 to 47.3% in 2020. This indicates a gradual decrease in the incidence of marital intentions among the unmarried, associated more with a tendency to not consider marriage rather than intentions against marriage.

### B. Incidence of Pregnancy and Childbirth

Existing respondents were asked about new pregnancies since the

previous wave. The share of those responding in the affirmative was 6.6% in the 3$^{rd}$ wave, decreasing gradually to 2.1% in the 8$^{th}$ wave. Among respondents who had ever experienced pregnancy, the majority had experienced it once, with most pregnancies resulting in childbirth.

## C. Marital Life with a Spouse Present

In cases where a spouse is present (including de facto marriages), and looking only at the marital lives of women currently cohabiting with a husband, women held generally positive perceptions regarding their husbands.

Generally, women themselves were the decision-makers in matters related to their own employment or re-employment. Likewise, matters related to the husband's employment or re-employment were decided by the husbands themselves. Joint decision-making regarding matters of children's education became more prevalent in recent waves. While matters of household finance - such as investments or asset management - were most often decided jointly by both spouses, day-to-day expenditures including the management of living expenditure was overwhelmingly determined by women. These findings suggest a gradually growing role of the father regarding matters of child rearing.

Time spent on domestic labor decreased dramatically recently among women, while that among men saw a gradual rise. Looking at satisfaction with the division of domestic labor, men were less satisfied with care labor compared to sharing domestic labor. This indicates that care-related labor is not yet being divided as satisfactorily for men as it is for general domestic labor.

## D. Family Relations

### 1) With Children

In the case of children in primary and secondary school, respondents talked with them most frequently about their school life. Conversations with unmarried adult children usually dealt with employment, careers, or their working lives.

Looking at economic interactions with adult children, the share of parents receiving economic support from unmarried adult children has decreased steadily. The instance of economic support from married children also decreased.

### 2) With Parents

The share of couples living with the wife's parents has risen, with the opposite being true in the case of the cohabitation with the husband's parents.

Where the wife's parents lived separately by themselves, there was a steady rise in the instance of economic support for them. Meanwhile, few respondents reported sending economic support to the husband's parents who lived separately. Instead, economic support was often sent to households where the husband's parents were dependent on the husband's sibling. Thus, economic support toward parents varied depending on the type of cohabitation arrangements.

## 4. Changes in Values and Health

### A. Values

#### 1) Values Regarding Marriage and Children

Among respondents to the 3<sup>rd</sup> wave survey, 64.7% held the view that 'It is imperative for everyone to get married'. This dropped 17.1%p to 47.6% by the 8<sup>th</sup> wave. Also, fewer respondents held the view that 'One should marry someone with similar family backgrounds'. A growing number of respondents opined that cohabitation need not be conditional on marriage, thus reflecting changing values regarding marriage. This demonstrates an overall shift in attitudes toward independence from the institution of marriage and childbirth, and plainly reflects the change in values that might explain the phenomenon of low fertility currently observed in Korea.

#### 2) Views on Roles within the Family

Regarding views on roles within the family, the most noticeable shift had to do with the traditional gender roles where 'Men are breadwinners and women are homemakers'. Whereas 57.6% of respondents agreed with this statement in the 3<sup>rd</sup> wave (2010), this fell 13.8%p to 43.8% by the 8<sup>th</sup> wave in 2020. More and more women are rejecting conventional traditional gender roles. Meanwhile, there have been little changes in the incidence of agreement on statements such as 'For equality in marriage, women just have jobs too' or 'Dual earner couples should share an equal burden of domestic labor'.

#### 3) Views on Familial Support

Familial support comprises two types of duties: that of parents toward

children, and that of children toward parents. Unlike in the case of views regarding marriage, childbirth, and gender roles, there has been little change in views on familial support during the period from 2010 to 2020. In the case of support toward children, there was a slight uptick in respondents agreeing on parent's responsibility for their children's education - particularly 'Parents must provide their children's university tuition'. In contrast, agreement with 'Parents must finance their children's marriage' dropped from 67.3% in the 3$^{rd}$ wave to 61.9% in the 8$^{th}$ wave. Thus, while parents are still regarded as being responsible for their children's education, there was a slight weakening in the view that they should support their children's marriage or provide financial support.

## B. Health Status

Into the 8$^{th}$ wave, there was a marked decrease in those reporting that they were overall healthy (the sum of 'Very healthy' and 'Mostly healthy' responses), accompanied by a rise in those reporting that they were unhealthy. This reflects how the COVID-19 pandemic has affected respondents' health assessment.

Information on the incidence of 'Feeling depressed during the past 1 week' was collected using a 4-point scale. Comparing the outcomes between the 7$^{th}$ and 8$^{th}$ waves can help gauge the impact of the 'contact-less' practices enacted during the pandemic. While there was a reduction in respondents voicing stress arising from personal relations, more respondents expressed difficulty coping with time spent in isolation.

Using the shortened (10-item) CES-D (Center for Epidemiological Studies-Depression Scale) instrument to measure depression, the share of respondents reporting 'depressed affect' grew gradually since the 6$^{th}$

wave, reaching 17.3% in the 8<sup>th</sup> wave.

The incidence of suicidal thoughts rose 0.2%p between the 7<sup>th</sup> and 8<sup>th</sup> waves. Among respondent who had attempted suicide, the share of those who said they received no help or counseling has grown since the 6th wave.

The share of respondents who reported receiving regular health screenings exceeded 70% in the 6<sup>th</sup> wave, reaching 75.8% in the 8<sup>th</sup> wave. However, as nearly a quarter of all women were found to receive no screenings, in-depth analysis may be needed regarding such 'blind spot' groups.

## 5. Economic Activities of Women

### A. Characteristics of Current Job

The rate of economic activity as measured by the 8<sup>th</sup> wave KLoWF was 55.6% - which is 4.4%p higher compared to the 4<sup>th</sup> wave but 1.6%p lower compared to the pre-pandemic 7<sup>th</sup> wave. Compared to the pre-pandemic 7<sup>th</sup> wave, the 8<sup>th</sup> wave saw the unemployment rate among the KLoWF sample rise 2.3%p to 5.4%, along with a 1.6%p rise in the economically inactive population.

81.9% of the respondents who were employed during the 6<sup>th</sup> wave were employed in the 8<sup>th</sup> wave, while 78.2% of panel respondents continuously retained their employment status up to the 8<sup>th</sup> wave. Among those employed during the 6<sup>th</sup> wave, 15.9% left the labor market and became economically inactive while 2.2% became unemployed in the 8<sup>th</sup> wave. Meanwhile, 46.6% of the unemployed in the 6th wave became employed in the 8<sup>th</sup> wave, while 21.5% of the economically inactive in the 6<sup>th</sup> wave became employed in the 8<sup>th</sup> wave.

### B. Currently Held Job

### 1) Changes in the Composition of Workers, by Work Status

Looking at changes among the employed by work status, 71.8% of the respondents who were wage workers in the 6$^{th}$ wave continuously retained that status until the 8$^{th}$ wave. 7.3% of those who were non-wage workers in the 6$^{th}$ wave transitioned to wage worker status in the 8$^{th}$ wave. Of those who were working in special forms of employment in 2016, 8.0% transitioned to wage worker status and 7.4% transitioned to non-wage worker status, and 14.7% dropped out of the labor market. Among survey participants, the transition rate from wage worker to non-employed (20.7%) was higher than that from non-wage worker to non-employed (13.5%). This is associated with the aging of the panel sample. The age at which workers leave the labor market is lower among wage workers compared to non-wage workers - this phenomenon is also apparent in the KLoFW.

### 2) Changes by Form of Employment

Looking at changes in forms of employment among wage workers across waves 6~8, 70.0% of wage workers who had regular contracts in the 6$^{th}$ wave continuously retained that status into the 7$^{th}$ and 8$^{th}$ waves while 6.6% transitioned to irregular contracts. On the other hand, 13.3% of those working under irregular contracts in the 6$^{th}$ wave transitioned to regular positions in the 8$^{th}$ wave while 60.3% remained under irregular contracts.

Of those who were full-time workers in the 6$^{th}$ wave, 5.6% transitioned to part-time positions while 21.6% transitioned to non-wage/special forms of employment/non-employment. Meanwhile, of those who were

part-time workers in the 6<sup>th</sup> wave, 13.0% transitioned to full-time positions in the 8th wave while 34.6% transitioned to non-wage/special forms of employment/non-employment.

### 3) Characteristics of Workers, by Work Status

Looking at the work hours of KLoWF respondents, the overall average weekly work hours was 42.3 hours in the 4<sup>th</sup> wave. This has fallen gradually, reaching 38.9 hours as of the 8<sup>th</sup> wave. Compared to the pre-pandemic 7<sup>th</sup> wave, average weekly work hours fell across all work statuses.

When asked about difficulties in running a business, the most frequent response among business owners (employers + self-employed) in the 8<sup>th</sup> wave was 'Low sales or profits', with about 71.5% of applicable respondents choosing 'very much so' or 'mostly so'. While this is 2.6%p higher compared to the 4<sup>th</sup> wave, it is 8.1%p higher compared to the pre-pandemic 7<sup>th</sup> wave. This reflects the extent of the impact the COVID-19 pandemic had on the sales and profits of business owners.

## 6. Work Environments and Job Search

### A. Job Satisfaction

### 1) Job Satisfaction

While job satisfaction was found to be high overall, 8<sup>th</sup> wave levels were slightly lower compared to the 7<sup>th</sup> wave. Satisfaction with income level, employment stability, job duties, work environment, and work hours all saw improvement. However, given the pandemic-related economic crisis which impacted the 8<sup>th</sup> wave, in interpreting results one

must bear in mind that these responses were given by those who managed to remain employed through the crisis. Meanwhile, satisfaction fell in areas such as personal growth potential, personal relations at work, workplace welfare, and recognition. This suggests that even those who remained employed despite the economic crisis saw decreasing monetary/intrinsic rewards from work.

2) Fit between Job Requirements and Worker Education/Skill Level

As of the 8th wave, respondents agreeing that their education level and skill level fit the requirements of their current job were 88.2% and 89.0% respectively, in following an upward trend.

3) Satisfaction with Work-Life Balance

Across various question items, respondents were asked how their work affected family life. The item that had the highest share of positive responses was 'Working gives me a purpose in life and a sense of vitality.' Responses to question items regarding the negative effects of work on family life followed a downward trend, suggesting that work-life balance has seen some improvement.

On question items about how family life affects their working lives, about 60~80% of respondents said that the effects were positive. However, the burden of childcare remained the greatest area of adverse impact with regards to work, followed by domestic labor and other caretaking labor.

## B. Gender-Based Discrimination in the Workplace

Respondents who were business owners or wage workers were asked

about discriminatory aspects in their workplaces' organizational culture. Discrimination with regards to allocation of job duties was found to be the most prevalent - an indirect indicator of the existence of glass ceilings - followed by promotion, selection for layoff, and pay. Thus, discrimination was observed in labor outcomes such as promotion, pay, and layoffs. While discrimination in education / training opportunities and recruitment was less prevalent, such disparities in work environment must be address as they are tied to labor market entry and retention.

## C. Maternity Protection Policies

While the fall in awareness regarding maternity protection policy might be regarded as a natural outcome of the ongoing aging of the study's respondent sample, for only women of childbearing age to be aware of such policies is insufficient for the universal availability of maternity protection. Broader availability of maternity protection schemes will call for greater awareness and consideration among groups of all ages, not only in workplace environments but throughout all of the labor market.

## D. Social Insurance

The National Pension saw rising incidences of enrollment and payout. The same trends were observed, albeit on a smaller scale, among Special Occupation Pensioners.

The share of EI enrollment fell between waves 7 and 8 while the incidence of payouts rose. This may be attributable to the fall in employment in EI-covered workplaces and the rise in unemployment payouts due to the pandemic's adverse economic impact. Similar trends were seen in IACI, along with the fall in the number of employed

persons.

### E. Job-searching Activities

Respondents who were currently jobless or were working less than 18 hours weekly as unpaid family workers were asked about their job-searching activities. Unemployed persons who were actively searching for jobs had spent 4 months on average job-searching. After a small uptick in the $6^{th}$ wave, this figure stood at 3.9 months as of the $8^{th}$ wave. Most job-searchers said they were looking for employment, and most respondents seeking employment expressed a preference for full-time positions.

When asked about the 2 main difficulties in relation to job-searching, the most frequent response as of the $8^{th}$ wave was 'insufficient/nonexistent job openings' (88.0%). Also, the share of respondents mentioning 'lack of information' rose compared to the previous wave, indicating the need for promoting and improving access to schemes such as Work Again Centers or WorkNet. In particular, it will be necessary to explore better means of disseminating information toward middle aged and older groups, who have relatively weaker access to online resources.

### F. Education and Training

Among all KLoWF respondents, the incidence of having received education or training the past 1 year has steadily fallen. This may be a natural outcome, given the lessened need for investing in education due to the aging of the survey's sample. This also explains why the most frequent reason for not having received education or training - including that for self-improvement, employment, or vocational development and

excluding regular education - was 'Felt no need'. However, given the industrial changes driven by technological advancements and the subsequent need for continuous training, a policy-based approach to lifelong learning may be necessary.

# Ⅳ. In-Depth Analysis

## 1. How Gender-Unequal Sharing of Domestic and Care Labor Affects Family Planning: with a Focus on Plans for a First or Second Child

The recent prevalence of DINK (dual income, no kids) couples has brought to attention the importance of plans for having a first child. This study draws on data from the 4$^{th}$ (2012) to 8$^{th}$ (2020) waves of KLoWF to analyze how, among wage-earning women of childbearing age, the unequal sharing of domestic and care labor between married couples affected plans and intentions for a first or second child.

Estimates from random effects and pooled multinomial logit models suggest that, while the degree (in terms of time) to which spouses took on domestic and care labor had no statistically significant effect on plans for a first child, it did become a factor that had a significantly positive effect on plans for a second child. In particular, women considering the birth of a second child viewed sharing the domestic labor burden as the most important familial role of their spouse.

These results suggest that enhancing gender equality within families is an important factor for boosting the birthrate, in particular for subsequent second children. Thus, various measures must be explored to encourage active male involvement in domestic/care labor. For instance,

expanding paternity leave schemes can be used to institutionally encourage male participation in domestic/care labor. Also, various educational programs and campaigns will be necessary for shifting social norms regarding stereotypical gender roles.

## 2. COVID-19 and Women's Life: with a Focus on Changes in Work, Care, and Everyday Life

This study looked at how COVID-19 affected the lives of married women (with spouse present) with a high school age or younger child in their care.

First, the study analyzed the pandemic's impact on women's subjective sense of well being (subjective health, stress level, depression level, familial discord, life satisfaction) and family relations (between couples, with children, with parents, related to domestic labor). Results show that, overall, subjective well being and family relations were affected adversely in cases where COVID-19 caused difficulties in areas such as employment, household finances (income and expenditure), and children's education/care, where COVID-19 caused job loss or a major drop in work hours/income or compensation, or where the pandemic exacerbated childcare-related difficulties.

Second, a joint PSM-DID(Propensity Score Matching & Difference in Difference) model was estimated to look at how pandemic-related shifts in childcare affected women's subjective well being. Results suggest that women who experienced pandemic-related childcare difficulties saw a worsening in subjective health, intensification of daily stress, and had a higher incidence of familial discord including physical/emotional domestic violence. Thus, childcare difficulties that became more

pronounced due to the pandemic had the effect of damaging women's sense of daily well being and overall quality of life.

# Ⅴ. Analysis of Data Quality and Measures for Improvement

## 1. Statistical Data Quality of the Cumulative 1st ~8th Wave Data

### A. Sample Attrition

Retention of respondents calls for a shift away from fieldwork and towards daily management. We suggest the active use of smart device-based means such as Kakao accounts. Previous studies show that factors associated with attrition include 1-person households, single (unmarried) status, and high residential mobility (Kim et al., 2014). As these factors coincide with the direction in which Korean society is shifting, such challenges must be met by building robust ecologies for data collection.

### B. Data Format and Dissemination

While KLoWF data is made available, to the extent possible, in long-form so as to facilitate panel data analyses, some purportedly long-form variables are actually provided in wide-form. While format-wise, entry values for variables are recorded in linear sequence, there arise cases where such entries must be separated from other variables in practice. An easy-to-follow guide must be provided to visitors to the data download site, so that researchers can readily grasp the survey's layout.

### C. Consistency of Responses

It is impossible to prevent inconsistencies in responses across different questions that arise, for instance, from recall error on the part of the respondent. However, providing prompts can help determine whether an inconsistency is attributable to recall error or to a flaw in survey design.

### D. Validity of Panel Data Composition

With variables prone to frequent within-respondent changes over time (e.g. marriage intentions of unmarried women, satisfaction with sexual relations, trust in spouse, sense of happiness, etc.), it is important to track changes in panel data format. There is a need to focus on descriptive statistics that take advantage of the characteristics of panel data, such as the distribution of transitions across categories and the extent of within-respondent changes. This will allow for the assessment of the value of the panel data format by variable, as well as the discovery of research topics that take advantage of panel data's strengths.

## 2. Short-Term Improvement Measures

### A. Addressing Sample Attrition

There is a need for more pro-active attempts to identify the determinants of attrition by employing individual response data. In the future, it will become more important to recognize the limitations of the data associated with attrition and consider means of data utilization that are less affected by said limitations.

## B. Providing Guidelines on Analysis Priority for Better Representativeness

A more practical and logical approach, which takes account of the user's perspective, is necessary. A guideline on analysis priority should be provided so that users can conduct analyses within the limitations of the data.

## C. Enhancing Data Collection Methods with Smart Devices

The digital economy of the present day largely involves businesses vying for the attention of users. Sitting through an in-person interview lasting upwards of 30 minutes calls for a great deal of patience on the part of the respondent. In view of this, collecting data through smart devices should be explored.

## D. Improving Survey Structure and Data Dissemination

First, it is necessary to boost user convenience by manually adjusting the level of additional questions that are not prone to human error, while also recording the reasons for 'not applicable' responses in the code book. This can be implemented by reducing auto-fill values in 'not applicable' cases for additional questions. Second, as inconsistencies may arise between constructed variables and other variables, there is a need to provide a list of such constructed variables and the data they draw upon. In cases where inconsistencies arise, especially in the Individual data, a guideline should be provided that lets users determine which data should be given priority.

### E. Improving Question Items with Additional Questions for Spouses

That there is no male analogue of the KLoWF that can be used for comparative purposes is a concern that may be raised repeatedly. To assess which aspects of the changes in women's lives are scientifically significant, there is a need to compare these findings with analogous results collected among men over the same time period. As an interim measure, it might be possible to direct questions to male husbands (with non-adult children) about matters such as childcare, paternal leave, and marriage satisfaction.

### F. Provision of ID Variables and Merging Schemes for Cross-Data Merging

It is important to provide users with data merging guides so that they can quickly and easily utilize data for analysis. Constructing ID variables and providing merging schemes will help users appreciate the value of the data and better utilize it.

### G. Introducing Additional Constructed Variables and Reinforcing Data Use Lists

To further promote KLoFW data use, it may be advisable to add constructed variables for users who are less familiar with the layout of the data. Although KLoFW already features numerous such constructed variables, there may be room for new variables than can enhance convenience. Another short-term task for promoting data use would be to reinforce the list of papers and studies that have utilized the KLoWF data.

## 3. Mid to Long-Term Improvement Measures

### A. Minimizing Sample Attrition

Some measures for minimizing sample attrition include the following: First, actively developing a mixed mode of data collection by exploring alternative data collection methods. Second, identifying the key dependent variables - in view of the purposes of the survey - and focusing sample attrition management efforts on this basis. Third, switching to a digital-based data collection method will allow for real-time monitoring of mean values of interest. Such a data collection environment will allow administrators to check whether the mean values of key dependent variables are systemically large or small, in addition to helping elicit cooperation from respondent groups that are deemed prone to dropout.

### B. Strengthening Representativeness by Building a Survey Ecology and Improving Weighting Techniques

Measures for strengthening a survey's representativeness must not be considered on a wave-by-wave basis, but rather across multiple waves. A survey 'ecology' must be built such that assessment efforts of multiple surveys can lead to higher-quality surveys in the future. Here, we present the setting of a benchmark dataset and updating weights with state-of-the-art (SOTA) techniques as measures that should be pursued first.

First, various different weight schemes should be applied to the same dataset to assess which scheme yields figures closest to the benchmark, or which fine-tuning settings yield figures closest to the benchmark. Based on this, weights should be updated techniques that are found to

be SOTA. Second, there is a need to update techniques for estimating accurate values from bias-prone sample data. Efforts to apply these techniques to panel surveys would strengthen the representativeness of studies that draw on KLoWF. In summary, tasks including 1) continuous updating of weighting techniques, 2) continuous monitoring of bias-generating factors, and 3) analysis of associations between bias and key dependent variables in KLoWF must be pursued concurrently.

### C. Developing Mixed Data Collection Methods: Always-on Collection Using Smart Apps

If data collection apps can be installed on to the smart devices of respondents, a more fundamental shift in data collection method might become feasible. It may become possible to minimize the burdens associated with in-person interviews - using smart data collection apps on smart devices to take full advantage of EMA (ecological momentary assessment) possibilities. If EMA is mixed in with in-person interviews, a substantial number of question items can be dispersed throughout the study period (2 years), thus minimizing interview durations and respondent burden while also boosting cooperativeness.

### D. Restructuring Survey Methods Around Dependent Variables

While the choice of dependent variable is ultimately up to the researcher to decide, key dependent variables in a survey must be identified during the planning stages and diligently tracked over time.

In the case of measuring perceptions, across-respondent attitude differences or within-respondent shifts across waves may be less than salient. To improve their usability as dependent variables, RPC

(randomized paired comparison) can be introduced to enhance the survey method. Applying RPC in question items will involve 1) data collection occurring online or on smart tablets and 2) the understanding that the same number of variables are generated in the raw data as the number of comparison pairs, with all non-responded pairs taking missing values.

## E. Developing Questionnaire Items that Reflect Research Trends and Improving Data Structure

KLoWF data usage cases should be reviewed in order to identify which topics are of most interest to researchers, so that relevant data can be collected in further detail. At the same time, efforts should be made to promote the use of topics that have not yet been used to their full potential.

Since research studies often reflect policy-related needs, it may be worth conducting a comprehensive review of childbirth/care-related research studies and papers in international journals - thus identifying which variables from which data sources were frequently used, as well as the implications that were drawn.

By looking at the distribution of dissertation topics, it would be possible to gauge which topics are of interest to upcoming researchers so as to inform the design of future panel studies.

## F. Exploring Methods for Cross-Data Integration

While we suggested transforming several variables into more user-friendly long-form variables as a short-term measure, this has limitations under the current survey design. Over the mid to long-term, the survey must become more integrated so that data can also become

more integrated, while also streamlining the number of datasets where possible. Thus, starting from the design stage, information on children/jobs can be integrated into the Individual survey. Such integration would help not only with user convenience and data use, but also strengthen the sustainability of maintenance efforts by the KWDI.

### G. Appending Regional Administrative Data to Maximize Data Usability

Multi-level analyses, where individual/household perception surveys are combined with region-level data, are not widely conducted in Korea. One of the main reasons for this is that region-level information is often available only at the broad city/province levels. Here, we propose appending regional administrative data to the Household data.

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