Urban Micro-Insurance Project Evaluation: Pre-Analysis Plan

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Abstract

This paper describes the analysis plan for a randomized controlled trial evaluating the effect of micro-insurance provision to informal workers in Nairobi, Kenya. In 2011, we worked with the Co-operative Insurance Company (CIC) to provide free health insurance to 300 randomly selected metal workers in Kamukunji Jua Kali. The policy included inpatient and outpatient coverage that applied to the participant's household. Another randomly selected sample of 300 Jua Kali workers received a one-time unconditional cash transfer equal in value to the insurance policy. This study aims to identify the impact of health micro-insurance vis-à-vis cash transfers on the economic and psychological well-being of treated individuals. This plan outlines our evaluation questions, outcomes of interest, and a proposed econometric approach.

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1 Introduction

Reduction of risk and vulnerability for individuals in developing countries is a major issue in development, owing to the fact that the poor are disproportionately affected by illness, natural disasters, and economic crises yet they have a more difficult time coping with these catastrophes. Micro-insurance — in its broadest definition a class of insurance schemes targeted towards the poor — is one of the most promising risk management tools in the development sector (Morduch 2006) (Dercon et al. 2008). Recent experimental and quasi-experimental studies demonstrate that the provision of micro-health insurance improves access to health care through the use of health care services conditional on health status (Jowett, Deolalikar, and Martinsson 2004) (Lei and Lin 2009) (Fitzpatrick, Magnoni, and Thornton 2011) though evidence on the direct effect on health is scarce. Evidence also suggests that micro-insurance has important positive effects on investment and production in rural settings (Cai 2013) (Janzen and Carter 2013) (Karlan et al. 2014). Research on the impact of micro-insurance in urban labor markets, however, is limited. Additionally, it remains unclear how micro-insurance improves the psychological well-being of the poor. The Urban Micro-Insurance Project (UMIP) seeks to answer these questions and, in doing so, also adds to the growing evidence on the welfare impact of an important development tool, namely micro-health insurance.

In order to identify the causal impact of micro-insurance, the project randomly selected a sample of informal workers into two treatment groups and one comparison group. The first treatment group received the CIC Afya Bora (meaning "good health") Health Insurance Policy free of charge while the second treatment group received an unconditional cash transfer equal to the cost of the insurance. Comparing the two treatment arms controls for any income effect and allows us to evaluate the impact of providing insurance relative to a cash transfer. The results from this study will be of value both to individuals in developing countries who are considering the purchase of micro-insurance to micro-insurance institutions who wish to offer insurance products that meet the needs of individuals in developing countries, and to policymakers interested in the returns that can be expected from investing in insurance.

2 Evaluation Questions

1. What is the impact of micro health insurance on economic welfare?
2. What is the impact of micro health insurance on psychological well-being?
3. What determines the adoption of micro-insurance among the poor?

3 Intervention

3.1 Context

The study worked with a very particular sector in Kenya, the informal sector, commonly known as the "Jua Kali" (literally meaning "under the hot sun") sector (Orwa 2007). The artisans, vendors, and mechanics in this sector face extreme vulnerability to illness, economic dislocation, and natural disasters. Yet, employment in Jua Kali increased by 5.1 million in 2002, accounting for 74.2 per cent of total non-farm employment, according to Kenyas Central Bureau of Statistics. The Jua Kali sector encompasses small-scale entrepreneurs and workers who lack access to credit, property rights, training, and good working conditions. JKA workers supply goods to local markets using predominantly manual labor and little capital, often making do with handmade tools. Their workshops and stands frequently lack electricity and running water. These workers are organized into various sheds built out of metal sheets that give little protection from the elements. Given the extreme health hazards that they face, Jua Kali workers can stand to benefit from insurance schemes that provide coverage in the event of workplace accidents.

3.2 Micro-Health Insurance

Subjects receiving insurance enrolled in the CIC Afya Bora plan, a combined inpatient and outpatient family health insurance policy. These treated households received inpatient benefits of up to KSH 250,000 per family that covered the costs of:

- Hospital accommodation charges for a general ward bed in contracted hospitals
- Doctor and healthcare professional fees
- Prescribed routine lab tests
- X-ray and ultrasound tests
- ICU, HDU, and theatre charges
- Prescribed medicines, dressings, and internal surgical appliances
- Routing diagnostic lab tests
- Day care surgery
- Maternity including non-elective caesarean section with 6 mo. waiting period

- Chronic and pre-existing conditions up to KSH 75,000

Households also received outpatient benefits of up to KSH 50,000 per family that covered:

- Routine outpatient consultation
- Diagnostic laboratory and radiology services
- Prescribed medicine and dressings
- HIV/AIDS related conditions and prescribed ARVs
- Routine immunizations
- Routine prenatal check ups
- Postnatal care up to six weeks after delivery
- Pre-existing and chronic conditions up to KSH 20,000
- Outpatient oncology
- Psychiatry and psychotherapy

Beneficiaries paid KSH 100 for each outpatient visit. Both covers included chronic and pre-existing conditions, including HIV/AIDS but excluded treatment outside Kenya, cosmetic treatment, treatment by non-qualified persons, infertility, self-inflicted injury, experimental treatment, and dental treatment unless occassioned by accidental injury. Beneficiaries could access these benefits through CIC's network of providers that included 26 mission and faith based hospitals in Nairobi.

The plan provided benefits to principals and spouses under 72 years old and children dependents younger than 25 years with proof of enrollment in school or college. Subjects were enrolled in the Afya Bora plan free of charge for one year, a value of KSH 12,745 for the principal, spouse and up to five dependents. Each additional child dependent increased the annual premium by KSH 2,000 per child. The project fully reimbursed households for the base cost and any added premium.

3.3 Unconditional Cash Transfer

Subjects in the second treatment group received an unconditional cash transfer equal to the net value of the annual premium they would have had to pay had they enrolled in the CIC Afya Bora scheme. The transfer was delivered to recipients electronically using the M-Pesa mobile money service. M-Pesa is a mobile money system offered by Safaricom, the largest Kenyan mobile phone operator. Using M-Pesa requires a registered SIM card and a valid Kenyan national ID card. The project transfered the money from Innovations for Poverty Action Kenya's (IPA-K) M-Pesa account to that of the recipient. To facilitate the transfers, we encouraged recipients to sign up for M-Pesa and helped them obtain, where necessary, all of the requirements for registration. The cash was transferred to the registered SIM card wirelessly and the recipient could withdraw the balance at an M-Pesa agent by putting the SIM card into the agents cell phone or by using their own phone.

4 Evaluation Design

4.1 Sampling Strategy

The project employed a randomized evaluation strategy in order to identify and evaluate the causal effect of providing health insurance to economic and psychological measures of welfare. We studied a randomly selected sample of metalworkers of the Kamukunji Jua Kali Association (JKA) in Nairobi, an organization comprised of an estimated 4,000 Jua Kali workers. Only adult JKA members who work in an area of Kamukunji Jua Kali that makes him or her eligible for voting rights with the JKA were eligible to participate in the research. We ran a preliminary survey including 1,392 JKA members between August 2008 and December 2010. We also ran a pilot study between Feburary 2010 and December 2010 to test the questionnaire and identify potential difficulties in the scale-up of the project.

After the census, the subjects were randomly stratified into three income groups according to household weekly income. 313 subjects with a weekly income greater than KSH 4,000 comprised the high income group. 300 subjcts with a weekly income between KSH 2,000 and KSH 4,000 comprised the middle income group. 242 subjects with a weekly income under KSH 2,000 comprised the low income group. We randomly selected subjects into one of the two treatment arms or the comparison group within each income strata.

4.2 Data Collection

Data collection for baseline ocurred between March 2011 and December 2011. Endline data collection ocurred between January 2013 and April 2013, over a year after the baseline. Trained interviewers used netbooks to administer the surveys in an office at JKA or at each respondent's business. Respondents received KSH 200 as payment for participating in each interview in addition to further payouts determined by responses in the time and risk preferences section of the survey. Following standard IPA procedure, we performed backchecks focusing on non-changing information on 10 per cent of all interviews. This procedure was known to field officers ex ante.

The survey instruments asked respondents about household characteristics, consumption, labor outcomes, insurance usage, health, self-reported well being, and time and risk preferences. To measure cortisol levels, we collected saliva samples using the Salivette (Sarstedt, Germany), which has been used extensively in psychological and medical research (Kirschbaum and Hellhammer 1989) and more recently in randomized trials in developing countries similar to this one (Fernald and Gunnar 2009). It required the respondent to chew on a sterile cellulose swab, which was then centrifuged and analyzed for salivary cortisol. Field officers collected saliva samples before and after each survey. In addition, we collected blood samples from respondents at the end of each survey. Trained phlebotomists took blood draws in the office. We stored these blood samples in our office at $-80°F$ and sent to the local laboratory for analysis at the end of every week.

4.3 Treatment Delivery

Respondents were informed of their treatment status after completing the baseline survey. In March 2012, subjects in the cash transfer group who completed the baseline and had a registered SIM card received an unconditional cash transfer via M-Pesa equal to the amount of the annual premium they would have had to pay under CIC Afya Bora. For the insurance group, the project helped subjects enroll in CIC Afya Bora by preparing required documents and submitting the application to CIC on their behalf. Beneficiaries then received an ID card from CIC which they could use to claim benefits in CIC's network of providers. Approximately 80 per cent of individuals in the insurance group had enrolled by April 2012, while about 15 per cent never successfully enrolled.

4.4 Sample Attrition

We found attrition rates of over 20 per cent for each group in the pilot study, indicating a high risk of attrition for the scale-up. To mitigate the attrition in the full study, we distributed KSH 1,000 as extra compensation for finishing both the baseline and endline, along with a lottery in which one respondent (among those who had finished all rounds) would win a first prize of KSH 20,000. We also rewarded KSH 10,000 and 5,000 to respondents drawn second and third respectively. Some factors that may have contributed to higher dropout rates include tracking issues, unwillingness to provide blood work, and ineligibility. Respondents were not interviewed in the endline if they were in the insurance group but did not enroll in the insurance, were in the cash transfer group but did receive the cash transfer, or refused to provide a blood sample. We will attempt to deal with attrition bias in our econometric design, with further details in Section 5.

5 Identification Strategy

5.1 Basic identification of treatment effects

Our basic treatment effects specification to capture the impact of the health insurance and cash transfers is

$$y_{ih} = \beta_0 + \beta_1 INS_{ih} + \beta_2 UCT_{ih} + \delta y_{ihB} + \varepsilon_{iht} \tag{1}$$

where y_{ih} is the outcome of interest for individual i in shed h. INS_{ih} is a treatment indicator that takes the value 1 for individuals that received the insurance and 0 otherwise. UCT_{ih} is a second treatment indicator that takes the value 1 for individuals that received the unconditional cash transfer and 0 otherwise. ε_{iht} is the idiosynratic error term. The omitted category in this specification is the comparison group. Because the cash transfer is equal to the value of the insurance policy, the presence of UCT_{ih} in the model allows us to control for the income effect associated with receiving free insurance. Thus, β_1 identifies the treatment effect of insurance on individuals in the insurance group compared to the control and β_2 is the effect of cash transfers on individuals in the transfer group compared to the control. Following McKenzie (2012), we will estimate equation 1 conditional on the baseline level of the individual outcome y_{ihB} to improve statistical power.

5.2 Testing for heterogeneous effects

We will test whether the impact of insurance and cash transfers varies with pre-determined individual and shed characteristics measured at baseline and denoted by X_{ih} for individual included in equation 2 below. X_{ih} denotes individual characteristics while X_h denotes shed level characteristics.

$$y_{ih} = \beta_0 + \beta_1 INS_{ih} + \beta_2 UCT_{ih} + \beta_3 X_{ih} + \beta_4 (INS_{ih} \times X_{ih}) + \beta_5 (UCT_{ih} \times X_{ih}) + \delta y_{ihB} + \varepsilon_{iht} \quad (2)$$

Dimensions of heterogeneity:

1. Assets and savings
2. Years of education
3. Gender of respondent
4. Having children
5. Hospitalization
6. Income group
7. Savings in social groups
8. Ownership of JKA business
9. Being a shed leader
10. Perceived occupational safety
11. Number of workers in the same shed
12. Proportion of treated workers in shed
13. Productivity in goods sold or produced
14. Hours worked per day and days worked per week
15. Daily wage or piecework
16. Willingness to pay for insurance
17. Risk and time preferences
18. Psychological welfare

5.3 Testing for spillover effects

Rigorously identifying spillover effects of health insurance in the workplace is important in evaluating the provision of micro-insurance as a policy tool. Giesbert and Steiner (2012) find that low-income individuals in development settings often have incomplete or erreneous perceptions about insurance and that experiences of peers are criticial in shaping these perceptions. Thus, spillover effects could be an integral component of the policy benefits of micro-insurance.

Since randomization ocurred at the individual level across the entire sample of JKA workers, we can examine shed level spillover effects on behavior and welfare. Of particular interest is the effect of treatment intensity in each shed, measured as the number of treated individuals in the shed normalized by membership size.

$$R_h^{INS} = \sum_{i=1}^{M_h} \frac{\mathbb{1}(INS_i = 1)}{M_h} \quad (3) \qquad R_h^{UCT} = \sum_{i=1}^{M_h} \frac{\mathbb{1}(UCT_i = 1)}{M_h} \quad (4)$$

R_h^{INS} is the treatment intensity measure capturing the share of workers who received the insurance in each shed while R_h^{UCT} captures the share of workers who received the cash transfer. M_h corresponds to the shed membership size. We are also interested in spillover effects due to the number of insurance claims made by co-workers so we construct a normalized measure C_h where s_i is the number of claims made by individual i in shed h.

$$C_h = \sum_{i=1}^{M_h} \frac{s_{ih}}{M_h} \quad (5)$$

We will estimate equation 2 with $X_h = \{R_h^{INS}, R_h^{UCT}, C_h\}$ to identify the effects of shed-level treatment intensity and co-worker insurance claims on each individual outcome y_{ih}. Because the shed size M_h, a component of our treatment intensity and claims measures, is likely endogenous to the outcomes of interests, we will estimate spillover effects using Two-Stage Least Squares with an exogenous instrument Z. Define Z_h as the proportion of treated subjects ($T_i = 1$) in each shed to total subjects interviewed ($H_i = 1$) in the shed.

$$Z_h = \frac{\sum_{i=1}^{M_h} \mathbb{1}(T_i = 1)}{\sum_{i=1}^{M_h} \mathbb{1}(H_i = 1)} \quad (6)$$

Predicted values of X_h are calculated from the first stage regression of X_h on Z_h in equation 7. We will substitute $\hat{X}_h$, estimated from equation 8, for values of X_h in the second stage regression with equation 2.

$$X_h = \pi_0 + \pi_1 Z_h + u_{ih} \tag{7}$$

$$\hat{X}_h = \pi_0 + \pi_1 Z_h \tag{8}$$

Thus from equation 2, β_3 identifies the effect of treatment intensity and co-worker insurance claims on non-treated workers. β_4 identifies these spillover effects on the insurance group compared to the control group and β_5 identifies the effects on the cash transfer group compared to the control group.

5.4 Estimating the system of related regressions

We might expect that the errors for each of these regressions are correlated. Instead of estimating these equations separately, we can estimate the system of seemingly unrelated regressions (SUR) to improve the precision of the coefficient estimates (Zellner 1962). SUR estimation is equivalent to OLS when the error terms are in fact uncorrelated between the regressions or when each equation containts the same set of regressors. Simultaneous estimation allows us to perform Wald tests of joint significance on the treatment coefficients.

5.5 Accounting for multiple inference

As our interventions are likely to impact a large number of economic behaviors and dimensions of welfare and given that our survey instrument often included several questions related to a single behavior or dimension, we will account for multiple inference by using outcome variable indices and family-wise p-value adjustment. We have catalogued below the primary groups of outcomes that we intend to consider in the analysis outlined above. For each of these outcome groups, we will construct indices (where possible) and for each of the components of these indices, and will report both unadjusted p-values as well as p-values corrected for multiple comparisons using the Family-Wise Error Rate.

Construction of indices: To keep the number of outcome variables low and thus allow for greater statistical power even after adjusting p-values for multiple inference, we will construct indices for several of our groups of outcome variables. To this end, we will follow the procedure proposed by Anderson (2008), which is reproduced below:

First, for each outcome variable y_{jk}, where j indexes the outcome group and k indexes variables within outcome groups, we re-code the variable such that high values correspond to positive outcomes. We then compute the covariance matrix $\hat{\mathbf{\Sigma}}_{\mathbf{j}}$ for outcomes in outome group j, which consists of elements:

$$\hat{\Sigma}_{jmn} = \sum_{i=1}^{N_{jmn}} \frac{y_{ijm} - \bar{y}_{jm}}{\sigma^y_{jm}} \frac{y_{ijn} - \bar{y}_{jn}}{\sigma^y_{jn}} \tag{9}$$

Here, N_{jmn} is the number of non-missing observations for outcomes m and n in outcome group j, $\bar{y}_{jm}$ and $\bar{y}_{jn}$ are the means for outcomes m and n, respectively, in outcome group j, and σ^y_{jm} and σ^y_{jn} are the standard deviations in the pure control group for the same outcomes.

Next, we invert the covariance matrix, and define weight w_{jk} for each outcome k in outcome group j by summing the entries in the row of the inverted covariance matrix corresponding to that outcome:

$$\hat{\mathbf{\Sigma}}_{\mathbf{j}}^{\mathbf{-1}} = \begin{bmatrix} c_{j11} & c_{j12} & \cdots & c_{j1K} \\ c_{j21} & c_{j22} & \cdots & \cdots \\ \vdots & \vdots & \ddots & \ddots \\ c_{jK1} & \vdots & \ddots & c_{jKK} \end{bmatrix} \tag{10}$$

$$w_{jk} = \sum_{l=1}^{K_j} c_{jkl} \tag{11}$$

Here, K_j is the total number of outcome variables in outcome group j. Finally, we transform each outcome variable by subtracting its mean and dividing by the control group standard deviation, and then weighting it with the weights obtained as described above. We denote the result $\hat{y}_{ij}$ because this transformation yields a generalized least squares estimator (Anderson 2008).

$$\hat{y}_{ij} = \left(\sum_{k \in \mathbb{K}_{ij}} w_{jk} \right)^{-1} \sum_{k \in \mathbb{K}_{ij}} w_{jk} \frac{y_{ijk} - \bar{y}_{jk}}{\sigma^y_{jk}} \tag{12}$$

Here, $\mathbb{K}_{ij}$ denotes the set of non-missing outcomes for observation i in outcome group j. The specifications described in Section 5 will use these transformed outcome variables wherever this is specified in Section 6.

Family-wise error rate: Because combining individual outcome variables in indices as described above still leaves us with multiple outcome variables (viz. separate index variables for health, education, etc.), we additionally adjust the p-values of our coefficients of interest for multiple statistical inference. These coefficients are those on the treatment dummies in the basic specifications, or those on the dummies for individual treatment arms. To this end, we proceed as follows, reproduced again from Anderson (2008).

First, we compute nave p-values for all index variables $\hat{y}_j$ of our j main outcome groups (see Section 6), and sort these p-values in ascending order, i.e. such that $p_1 < p_2 < \cdots < p_J$.

Second, we follow Anderson's variant of Efron & Tibshirani's (1993) non-parametric permutation test: for each index variable $\hat{y}_j$ of our j main outcome groups (see Section 6), we randomly permute the treatment assignments across the entire sample, and estimate the model of interest to obtain the p-value for the coefficient of interest. We enforce monotonicity in the resulting vector of p-values $[p_1^*, p_2^*, \cdots p_J^*]'$ by computing $p_r^{**} = \min\{p_r^*, p_{r+1}^*, \cdots p_J^*\}$, where r is the position of the outcome in the vector of nave p-values.

We then repeat this procedure 10,000 times. The non-parametric p-value, p_r^{fwer*}, for each outcome is the fraction of iterations on which the simulated p-value is smaller than the observed p-value. Finally we enforce monotonicity again: $p_r^{fwer} = \min\{p_r^{fwer*}, p_{r+1}^{fwer*}, \cdots p_J^{fwer*}\}$. This yields the final vector of family-wise error-rate corrected p-values. We will report both these p-values and the nave p-values. Within outcome groups, we report nave p-values for individual outcome variables other than the indices.

5.6 Minimizing attrition bias

To assess whether attrition potentially confounds our results, we proceed as follows. First, we define:

$$attrit_{ih} = \mathbb{1}\left(\sum_{j=1}^{J}\sum_{k=1}^{K}\left(\mathbb{1}\left(y_{ihB}^{jk} \neq \text{missing}\right)\right) > 0 \quad \cap \quad \sum_{j=1}^{J}\sum_{k=1}^{K}\left(\mathbb{1}\left(y_{ihB}^{jk} \neq \text{missing}\right)\right) = 0\right) \tag{13}$$

Here, y^{jk} is the $\{j, k\}$ element in the $j \times k$ matrix of outcomes $\mathbf{Y}$ and represents outcome k in outcome group j. Thus, $attrit_{ih}$ indicates whether individual i was surveyed at baseline but not at endline. We then calculate overall attrition by treatment group.

We then assess the severity of attrition using three approaches. First, equation 14 estimates whether the magnitude of attrition is different for treatment and control individuals:

$$attrit_{iv} = \alpha_v + \beta_0 + \beta_1 T_{ih} + \varepsilon_{iht} \tag{14}$$

Second, equation 15 assesses whether attrition individuals are different in terms of a comprehensive range of baseline characteristics:

$$y_{ihB} = \alpha_h + \beta_0 + \beta_1 attrit_{ih} + \varepsilon_{iht} \tag{15}$$

And third, equation 16 measures whether the baseline characteristics of attrition individuals in the treatment group are significantly different from those in the control group. The sample for regression will be restricted to attrition individuals:

$$(y_{ihB} \mid attrit_{ih} = 1) = \beta_0 + \beta_1 T_{ih} + \varepsilon_{iht} \tag{16}$$

If worrying levels of attrition are found, we will adjust for the potential effect of such attrition by modeling the sample selection process (Heckman 1979) and by bounding our parameter of interest (Horowitz and Manski 1998) (Horowitz and Manski 2000) (Lee 2009). We will report the results of each analysis in the final paper.

6 Outcomes of Interest

In this section, we list the outcome variables by outcome group, which we will examine. Variables which are marked * will be constructed from the raw collected data. Variables marked with † will not be analyzed as individual outcomes and will not be included in the multiple inferences correction because we have weak *a priori* hypotheses about them.

6.1 Assets

1. Cell phone
2. Sofa or chairs
3. Piped water
4. Clock/watch
5. Bicycle
6. Radio, tape, or CD player
7. Battery
8. Generator
9. Motorcycle

10. Car/Truck
11. Solar panel
12. Television or computer
13. Farming tools
14. Wheelbarrow
15. Cart
16. Kerosene stove
17. Refrigerator
18. Renting or owning a house
19. Moved to different house
20. House has electricity
21. Total value of assets*
22. **Asset Index***: Weighted standardized average of 1 - 17

6.2 Consumption

1. House rent
2. House mortgage
3. Drinks (non-alcoholic)
4. Airtime, Internet
5. Cigarettes/alcohol
6. Restaurant/prepared meals
7. Travel, transport, and hotels
8. Gambling
9. Clothing

10. School fees and supplies
11. Medical expenses
12. Fixing fire damage
13. Fixing water damage
14. Work materials
15. Religious expenses
16. Social expenses
17. Gifts to friends
18. Electricity
19. Water
20. Domestic Staff
21. Insurance
22. Bride price
23. Fuel
24. Total annual expenditure*
25. Health expenditure* (Medical expenses, Health insurance)
26. Temptation goods expenditure* (Gambling, Alcohol/Cigarettes)
27. Social expenditure* (Restaurant/prepared meals, Religious expenses, Social expenses, Gifts to friends, Bride price)

6.3 Borrowing and Savings

1. Have any loans
2. Total amount borrowed*
3. Ability to repay loans*
4. Remittances received in past month

5. Remittances sent in past month
6. Amount currently saved
7. Amount saved each month in social group*
8. How secure do savings make you feel?
9. Can savings cover health expenses?

6.4 Health

1. Sickness or injury in the past month
2. Sickness or injury is work-related
3. Proportion of household sick or injured*
4. Proportion of children sick or injured*
5. Number of chilren passed away within last year
6. Days of work/school missed due to illness/injury in the past month

Healthcare use

1. Child vaccination
2. Proportion of children vaccinated*
3. Child preventative care check-ups
4. Consulted with health care provider for illness/injury
5. Total treatment costs associated with illness/injury
6. Number of nights hospitalized over the past year
7. Total cost of hospitalization in the past year
8. Number of nights in the past year where member should have been hospitalized but wasn't
9. Ability to pay for medical treatment

6.5 Labor

1. Will leave JKA
2. Will change occupation within JKA
3. Will move to a riskier occupation*
4. Average weekly income in the past year
5. Last week's income
6. Predicted weekly income next week
7. Average number of hours worked per day
8. Average number of days worked per week
9. Involved in production, sales, or both
10. Self-employment
11. Average goods produced per day
12. Goods produce per day last week
13. Productivity per day*
14. Attended school in the past year
15. Took formal training course in the past year
16. Took informal training course in the past year
17. Shed leader
18. Level of trust in shed members
19. Perceived risk of own job
20. **Labor Mobility Index***: Weighted standardized average of 1 - 3
21. **Productivity Index***: Weighted standardized average of 4 - 8, 11 - 13

6.6 Insurance

1. Trust in insurance companies
2. Likelihood of keeping CIC insurance
3. Owning fire insurance
4. Owning inpatient insurance
5. Owning outpatient insurance
6. Owning life insurance
7. Owning accident insurance
8. Willingness to pay for fire insurance
9. Willingness to pay for inpatient insurance
10. Willingness to pay for outpatient insurance
11. Willingness to pay for outpatient insurance with co-pay
12. Willingness to pay for life insurance
13. Willingness to pay for critical illness insurance
14. Number of times used fire insurance
15. Number of times used inpatient insurance
16. Number of times used outpatient insurance
17. Number of times used outpatient insurance with co-pay
18. Number of times used life insurance
19. Number of times used critical illness insurance
20. **Insurance Ownership Index***: Weighted standardized average of 3 - 7
21. **Insurance WTP Index***: Weighted standardized average of 8 - 13
22. **Insurance Usage Index***: Weighted standardized average of 14- 19

6.7 Psychological & Neurobiological Welfare

1. Summary of worry incidents*
    (a) Worry over health problems
    (b) Worry over accidents and disasters
    (c) Worry over problems in the workplace†
    (d) Worry over finding work†
    (e) Worry over losing employment†
    (f) Worry over having too much work to do†
    (g) Worry over having enough money for basic needs†
2. Cortisol level
3. Cytokine level
4. Perceived Stress Scale score
5. Locus of Control score
6. Scheier Optimism score
7. Self-Esteem Scale score
8. CES-D
9. World Value Survey happiness
10. World Value Survey satisfaction
11. **Self-Reported Welfare Index***: Weighted standardized average of 4 - 10
12. **Neurobiological Welfare Index***: Weighted standardized average of 2 - 3

6.8 Preferences

1. Impatience
2. Decreasing impatience
3. Risk aversion
4. Other-regarding preferences

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