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RESEARCH PAPER

The Effects of Chronic Illness on Aspirations and Subjective Wellbeing

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Abstract
Many studies across disciplines assert that chronic illness and emotional wellbeing are closely related. Yet, studies in the literature rarely examined the mediators of the relationship from a socioeconomic perspective. In particular, despite its significance in the welfare of people in developing countries, studies have rarely investigated the e ects of chronic illness on, among others, aspirations, the failure of which may be linked to a self-sustaining trap of poverty in developing countries. Using two waves of Indonesian Family Life Survey (IFLS 2007, 2014), this paper examines the e ect of chronic illness on aspirations and the channel through which the duration of chronic illness a ects aspirations and emotional wellbeing. To this end, this paper uses a variable measuring an aspirations gap, constructed by a di erence between an individual's current level of life evaluation and his/her future aspired level of wealth. Overall, results of this study suggest that chronic illness brings about a vicious cycle in which a deterioration in an individual's current life evaluation, compared to the person's cognitive neighborhood, leads to a greater aspirations gap, which, in turn, reinforces feelings of unhappiness and dissatisfaction with life. Furthermore, the e ects of chronic illness are found to be greater on the poor in the bottom 25% of household income.

Keywords Aspirations · Chronic illness · Subjective wellbeing · Happiness · Indonesia

JEL Classification I15 · I31 · O12

1 Introduction

In many developing countries, the burden of morbidity is greater than in developed countries (Abegunde et al. 2007). Among others, chronic illness is associated with large increased health care costs, productivity costs, and negative welfare consequences for individuals, their family and society as a whole (Abegunde et al. 2007; Mayosi et al. 2009; Lim 2017a). Furthermore, it has long been recognized that chronic conditions and emotional

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wellbeing are closely related (Wolman et al. 1994; Banks and Kerns 1996; Folkman and Greer 2000; Neugebauer et al. 2003; Newman et al. 2004; Steptoe et al. 2015; Outcalt et al. 2015; Hartog et al. 2017). Yet, the mediators of the relationship between these two variables have rarely, if ever, been investigated from a socioeconomic perspective. The issue is nontrivial in that chronic illness may a ect the welfare of future generations via a socioeconomic mediator. For instance, the future-oriented behaviors of the poor may be influenced by emotional wellbeing factors such as despair and frustration triggered by changes in their relative socioeconomic status over the period of illness.

One aspect of chronic illness that has rarely been explored in the literature is its e ects on aspirations, the failure of which may be reciprocally linked to a self-sustaining trap of poverty (Dalton et al. 2015; Pasquier-Doumer and Brandon 2015; Chivers 2017; Genicot and Ray 2017). Previous studies suggest that the poor may not take actions to improve their wellbeing unless they see a feasibly higher level of wellbeing in the near future than their current standard of living (Appadurai 2004; Ray 2006; Macours and Vakis 2014; Dalton et al. 2015). Likewise, chronic illness of adults may also a ect their investment in children's human capital via the channel of the aspirations failure and psychological distress caused by changes in socioeconomic status relative to their cognitive neighborhood.[1] Identifying the role of the aspirations is also of special interests to policy makers who are concerned with non-pecuniary costs of chronic illness in terms of the income inequality and intergenerational transmission of poverty in developing countries, where the poor are more vulnerable to health shocks. In this sense, the lack of attention to aspirations failure as the mediator between chronic illness and emotional wellbeing is remarkable in the literature.

Using two waves of Indonesian Family Life Survey (IFLS 2007, 2014), this paper aims at filling this gap by examining the e ects of chronic illness on aspirations and subjective wellbeing (SWB).[2] This study, following Kahneman and Deaton (2010) and Deaton and Stone (2014), distinguishes between two concepts that are often confounded in the literature regarding SWB; emotional wellbeing that is sometimes called hedonic wellbeing and life evaluation that refers to an individual's thoughts about his/her current level of wellbeing measured by a socioeconomic ladder. In this study, the former is assessed by a question about overall happiness at the time of survey while the latter is measured by a six-step ladder where on the bottom stands the poorest group. On the other hand, this paper defines aspirations as future reference points for individuals' desired level of wealth,[3] which are assumed to be influenced both by an individual's internal constraints and by ambient income distribution in their cognitive neighborhood.[4] The aspirations gap, a variable of a special attention, is constructed by a di erence between an individual's current level of life evaluation and future reference point. According to Ray (2006), it is this gap rather than aspirations per se or one's standard of living per se that a ects future-oriented behavior of individuals such as investment decisions.

The main hypothesis of this paper is that chronic illness lowers emotional wellbeing as individuals su ering the illness feel more deprived while their aspirations gap increases

[1] This cognitive neighborhood, according to Ray (2006), is composed of her similar or attainable individuals in her cognitive world. He labels this as one's aspirations window.

[2] Chronic illness is defined in more detail in Sect. 3.3.

[3] The term aspirations lends itself to a variety of definitions and interpretations. So, the definition of aspirations needs be contextualized, and further, should address both present and future perspectives. This definition is consistent with the data used in this paper.

[4] This assumption is consistent with Dalton et al. (2015) and Genicot and Ray (2017).

over the duration of illness. The deterioration of emotional wellbeing occurs as the individuals compare their material wellbeing with that of others in their cognitive neighborhood and with their future reference point. The empirical investigation of this paper is also in part based on a recent economic theory that underinvestment problems may occur not only as a result of a lower aspirations gap but also due to frustration that results from an excessive aspirations gap (Genicot and Ray 2017). If the theory holds, chronic illness may lead to frustration and underinvestment as the di erence becomes greater between the future reference point and current life evaluation. The findings of this study, thus, present meaningful empirical evidence to the literature on aspirations and underinvestment problem (Bernard et al. 2011; Macours and Vakis 2014; Mekonnen and Gerber 2016; Genicot and Ray 2017). Overall, this paper contributes to the exiting literature on chronic illness and emotional wellbeing by shedding light on the role of the aspirations gap in the deterioration of emotional wellbeing over the duration of illness.

2 Related Literature

Psychological studies of chronic conditions have long recognized the important role of future cognitions in the relationship between chronic illness and emotional wellbeing (Macleod et al. 1997; Macleod and Moore 2000; Macleod and Salaminiou 2001; Disner et al. 2011; Rusu and Pincus 2017), but the literature has paid little attention to aspirations as a mediator between the two variables. The issue is important as income inequality and intergenerational transmission of poverty may occur via the channel of aspirations failure (Appadurai 2004; Genicot and Ray 2017; Healy et al. 2017). In fact, a growing literature provides evidence for the linkage between aspirations failure and individuals' investments decisions (Bernard et al. 2011; Macours and Vakis 2014; Mekonnen and Gerber 2016; Genicot and Ray 2017). Chronic illnesses of parents may also a ect investment decisions on children's human capital although there is little empirical evidence that sheds light on the role of aspirations failure in this context. For instance, recent studies show that parental health negatively a ect schooling of children in developing countries (Bratti and Mendola 2014; Alam 2015). However, the channels through which chronic illnesses of parents a ect schooling of children have not been clearly identified in the literature. The prior literature suggests that health shocks hinder schooling primarily through two channels: (i) reduction of household's ability to a ord education (Alam 2015), and (ii) reduction of the quantity and/or quality of parental time inputs into child rearing (Bratti and Mendola 2014).[5]

The possible e ects of chronic illness on aspirations are ambiguous, and there is an imperative need to examine the link, especially in the context of developing countries. Aspirations may decrease as the productivity and wealth level of individuals with chronic conditions decrease due to their health conditions and costs of illnesses (Lim 2017b). Chronic illness may also widen the aspirations gap as the current life evaluation deteriorates while the aspired level of standard living remains unchanged. In such a case, the greater aspirations gap may result in a lower level of life satisfaction and emotional wellbeing. While there exists little empirical evidence for this direction, Dibb and Yardley (2006) show that greater levels of social comparisons within self-help groups for people

[5] Parental health shocks may a ect schooling of children through intra-household labor substitution, but there exists little empirical evidence for this explanation.

with chronic illness are associated with a deteriorating quality of life. On the other hand, studies in psychology present mixed e ects of chronic illness on aspirations. For instance, individuals with chronic conditions may negatively alter their treasured life goals or plans that bring meaning to life (Scheier and Bridges 1995; A eck et al. 2001; Stanton et al. 2007). Individuals, in contrast, may cope with their illness by engaging in positive thinking or wish-fulfilling fantasies (Fournier et al. 2002; Livneh and Antonak 2005; Hanssen et al. 2013). Both strategies are likely to raise the aspired or expected level of future wealth, but studies suggest that wish-fulfilling fantasies, unlike positive thinking, provide no escape from the stresses of illness and reinforce feelings of unhappiness and a self-pitying longing for better times (Felton et al. 1984; Oettingen 1996; Oettingen and Mayer 2002). In the following sub-sections, implications from the related literature are discussed in more detail from the perspective of economics and psychology, respectively.

2.1 Effects of Chronic Illness on Aspirations in Economics

In an influential contribution, anthropologist Arjun Appadurai (2004) argued that the poor may lack the capacity to aspire and that the future-oriented logic of development could help the poor find the resources required to contest and alter the conditions of their own poverty. Since then, a growing literature has drawn attention to aspirations within the premise of economics. Studies have shown the relationship between aspirations and inequality (Genicot and Ray 2017; Healy et al. 2017), the linkage between aspirations and economic investments (Bernard et al. 2011; Macours and Vakis 2014; Mekonnen and Gerber 2016), aspirations and human capital investments (Coleman and DeLeire 2003; Lim 2018), and e ects of aspirations on food security (Mekonnen and Gerber 2017). Despite its significance in economic development and development studies, however, factors a ecting aspirations remain largely unexplored in empirical studies, especially in the context of developing countries.

Following Appadurai (2004), some economists also propose that aspirations are socially determined (Ray 2006; Stark 2006; Bogliacino and Ortoleva 2013; Genicot and Ray 2017). For instance, Ray (2006) argues that aspirations are born in a social context and reflect an individual's cognitive world such as his/her zone of similar or attainable individuals, which is labeled as the individual's aspirations window. Other individuals serve to condition and determine the goals and aspirations of any particular person. Similarly, Genicot and Ray (2017) model aspirations as socially determined reference points via exogenously specified aspiration windows. In their model, a decrease in incomes relative to others raises that person's aspirations gap. This view suggests that the aspirations gap of the individual is likely to increase as duration of chronic illness depletes the wealth of the person through several mechanism such as a loss of job, a lower productivity and higher medical costs, while the real incomes of other people in the aspirations window stay constant. In contrast, Dalton et al. (2015) developed a theoretical model in which an individual's own psychological, rather than social, constraints shape aspirations, resulting in an aspirations failure. According to the model, a decision maker internalizes the feedback between e ort and aspirations, and aspirations are consistent with the expected level of final wealth given the individual's e ort. Thus, the poor would optimally choose a lower level of e ort than the rich due to productive e ects of resource constraints they face, and the lower e ort of the poor will cause their aspiration level to be lower than that of the rich. In this model, chronic illness, while the poor set aspirations, may impose additional external constraints that exacerbate

the adverse e ects of the behavioral bias, leading to an aspirations failure. In all the models above, aspirations and the distribution of income evolve jointly, and emotional wellbeing is likely to deteriorate over the duration of chronic illness.

While there is little empirical research examining determinants of aspirations, some studies present evidence in support of the view that aspirations are formed in a more multi-dimensional context than the theories in economics propose. One example of a study using a randomized natural experiment shows that female leadership influences adolescent girls' career aspirations and educational attainment in India (Beaman et al. 2012). Kosec and Mo (2017), on the other hand, show that natural disasters significantly lower aspirations, especially among the rural poor in Pakistan. They also show that government social protection can significantly blunt negative impacts on aspirations stemming from natural disasters. The results of these studies may be justified from the perspective of the aspirations window (Ray 2006) or similarly through the lens of a capacity to aspire (Appadurai 2004), but they also show that factors a ecting aspirations need to be explored further in empirical studies across academic disciplines.

2.2 Effects of Chronic Illness on Aspirations in Psychology

While economists would view that aspirations are likely to decrease or that the aspirations gap increases over the horizon of illness duration, one can derive from research in psychology mixed e ects of chronic illness on aspirations and emotional wellbeing. Studies in psychology have typically yielded theoretical frameworks to identify the factors that promote or hinder adjustment to chronic illness and empirical evidence regarding the predictive utility of those constructs (Stanton et al. 2007).[6] For instance, in Lazarus's stress and coping theory (Lazarus and Folkman 1984), cognitive appraisal processes are assigned central importance. According to the theory, cognitive appraisal occurs when a person considers the situation that could potentially a ect his/her physically and emotionally. It involves estimating the severity of a stressor and classifying it as either a threat or a challenge. Ever since the introduction of the theory, perceived threats to health and life goals have received a good deal of empirical attention. One example is Carver and Scheier's (2001) self-regulation theory, in which illness represents an experience that can interfere with treasured life goals or plans that bring meaning to life (Scheier and Bridges 1995). Thus, individuals with chronic illness may negatively alter their future goals or reference points, the extent of which is likely to depend on the severity of their illness.

In contrast, according to another study, chronic illness may not lower the reference points or life goals as patients may cope with their illness by adopting positive thinking or wish-fulfilling fantasies as their coping strategies (Livneh and Antonak 2005). Numerous studies have documented the importance of individual coping strategies in helping ill adults maintain reasonable levels of emotional wellbeing (e.g., Cohen and Lazarus 1979; Moos and Schaefer 1984; Felton et al. 1984; Catz et al. 2002). Research consistently finds that positive thinking about the future fosters motivation and successful performance while enhancing mental health and wellbeing (Taylor and Brown 1988; Scheier and Carver 1992; Bandura 1997; Macleod and Moore 2000; Seligman 2011). In contrast, unlike positive thinking, wish-fulfilling fantasies tend to have detrimental e ects on subjective and emotional wellbeing. For instance, Felton et al. (1984) assert that chronic illness often

[6] See Stanton et al (2007) for the list of the factors which include socioeconomic status, culture and ethnicity, gender-related processes, interpersonal relationships, personal attributes, cognitive appraisals, and coping processes.

brings about a vicious cycle in which unhappiness and di culties in adjustment lead to wishful ruminations. Overall, the coping strategies people employ and their utility are likely to vary as the adaptive tasks of illness change (Blalock et al. 1993). The e ects of chronic illness on aspirations, in this sense, are likely to di er by personality, socioeconomic status, and duration of illness (Helgeson 1992; Boudrez and De Backer 2001; Dew et al. 2005). Nevertheless, uncertainty about the future appears to be a common concern across diseases and individuals (e.g., Dunkel-Schetter et al. 1992; Lillrank 2003), and the e ects of chronic conditions on aspirations appear to be ambiguous in psychology theories.

3 Methodology

3.1 The Estimation Procedure

The empirical models in this study attempt to examine the mechanism by which duration of chronic illness a ects emotional wellbeing from a socioeconomic perspective. The main conjecture and hypothesis of this study is that chronic illness a ects emotional wellbeing via the channel of the aspirations gap, which is assumed to be socially-dependent. More intuitively, individuals with chronic illness would experience a deterioration of emotional wellbeing as they evaluate their current socioeconomic status relative to that of their cognitive neighborhood and to their future reference point over the duration of illness. To examine this conjecture, the empirical models of this paper test first, using two waves (2007 and 2014) of longitudinal data of Indonesian Family Life Survey, whether or not the duration of chronic illness a ects the aspirations gap. Then, additional regressions are run to test if duration of chronic illness a ects an individual's future reference point or current life evaluation. This step is needed to examine how chronic illness a ects the aspirations gap, which in this study is constructed from the di erence between measures of an individual's future reference point and current life evaluation. Consistent with the socially dependent aspirations theory, this study uses measures constructed from an imaginary six-step socioeconomic ladders, available from the two wave of Indonesian Family Life Survey (IFLS) data (2007 and 2014). Furthermore, the e ect of duration of chronic illness on emotional wellbeing is examined using measures of happiness as well. Finally, as a robustness check and to derive the socioeconomic implications for income inequality and intergenerational transmission of poverty, this paper further examines di erential e ects of chronic illness on the aspirations gap and emotional wellbeing by disaggregating the sample based on family income. Intuitively, the poor would have limited resources to cope with health shocks and hence the e ects of chronic illness, if the main conjecture of this paper holds true, would found to be greater than others in wealthier households.

3.2 Model Specifications

For the estimation of chronic illness on the aspirations gap, this study uses a variable constructed from a di erence between one's current level of life evaluation and future (5 years later) aspired level of material wellbeing, available from the IFLS data. The following model is employed to estimate determinants of changes in the aspirations gap (A_{ihv}).[7]

[7] The use of expected level of wellbeing as a proxy for aspirations is based on a recent economic theory (Dalton et al. 2015), where aspirations are equal to (or consistent with) the expected level of final wealth given a decision maker's e ort as she internalizes the feedback between e ort and aspirations. The idea

$$\Delta A_{ihv} = \alpha + \beta_1 C_{ihv} + \beta_2 \Delta I_{ihv} + \beta_3 X_{ihv} + \beta_4 \Delta H_{hv} + \beta_5 \Delta V_v + \varepsilon \quad (1)$$

which is a regression of changes in the aspirations gap for individual i in household h and village v against the duration of chronic illness symptoms (C_{ihv}), changes in income (ΔI_{ihv}), a series of demographic controls (X_{ihv}), changes in household specific variables (ΔH_{hv}), changes in village specific variables (ΔV_v), and a random error. Some studies suggest that SWB bounces back after an initial health shock (Oswald and Powdthavee 2008; Powdthavee 2009; McNamee and Mendolia 2014). For instance, Oswald and Powdthavee (2008) provides longitudinal evidence for the existence of hedonic adaptation to disability. Such adaptations may also occur as individual perceptions of health status improves over a disease trajectory (Cubí-Mollá et al. 2017). According to this view, aspirations may not decrease linearly as the duration of chronic illness increases. To account for this possibility, the squared term of illness duration is also included in the model. This paper also controls for relative family income, which is constructed from the mean family income of each respondent's community (*kecamatan*).[8] The inclusion of changes in relative income is essential to account for any possible e ect predicted by the theory of the hedonic treadmill (Easterlin 2001), which predicts that aspirations perpetually increase as income increases.

For the estimation of the e ect on changes in life evaluation, this study uses the following model that regresses first-di erenced measurements of life evaluation against the duration of chronic illness and other control variables.

$$\Delta W_{ihv} = \alpha + \beta_1 C_{ihv} + \beta_2 \Delta I_{ihv} + \beta_3 X_{ihv} + \beta_4 \Delta H_{hv} + \beta_5 \Delta V_v + \varepsilon \quad (2)$$

where ΔW_{ihv} measures changes in life evaluation for individual i in household h and village v between 2007 and 2014. Finally, to estimate the e ect of duration of chronic illness on emotional wellbeing, the estimation model (2) replaces the dependent variable with changes in happiness levels measured in 2007 and 2014. In all models, any significant e ect of the duration of chronic illness will be reflected in the coe cient β_1.

3.3 Econometric Issues

In this study, the aspirations gap variable (A_{ihv}) is constructed based on 2007 and 2014 waves of surveys, which ask the respondents which step they are now and expected to be in 5 years later on an imaginary ladder where on the bottom stand the poorest group. By subtracting the aspiration gap of 2007–2012 from that of 2014–2019, the estimation model sweeps out correlation from omitted unobserved individual characteristics that confound identifying the e ect of chronic illness on the aspirations gap and SWB. For instance, a pessimistic individuals may over-report chronic symptoms while such pessimism inversely a ects their life evaluation and expectation about future wellbeing. Moreover, there may be an intrinsic level of aspirations for each individual, although it is likely to change by age, health conditions, and culture. The di erencing is supposed to resolve the issues in the model. On the other hand, one may argue that a higher level of expected wealth may be induced by some village-specific confounding factors that may also a ect the diagnosis of chronic illnesses. This is important because the report of chronic conditions in this study is

Footnote 7 (continued)
is also consistent with the reference-dependent theory of Tversky and Kahneman (1991) and MacLeod (1995)'s take on aspirations in that aspirations are assumed to reflect an individual's view of her own chances for getting ahead.

[8] This is equivalent to a subdivision of a city.

based on the diagnosis results from physicians, nurses, or other medical practitioners. Villages with growing economies may also have better healthcare infrastructure, which may translate into higher aspiration gaps. Moreover, a recent study shows that natural disasters significantly lower aspirations, especially among the rural poor in Pakistan (Kosec and Mo 2017). Since natural disasters can also a ect health conditions of the residents in the village, the model needs to take into account this possible confounding factor in the estimations. To account for these endogeneity issues, the empirical models in this study also estimate the e ects of chronic illness with village-fixed e ects as follows.

$$A_{ihv} = \alpha_v + \beta_1 C_{ihv} + \beta_2 \Delta I_{ihv} + \beta_3 X_{hv} + \beta_4 \Delta V_v + \varepsilon \quad (3)$$

where village fixed e ects (α_v) are controlled at the *kecamatan* level. Additionally, this paper, consistent with many other SWB studies in the literature, uses an ordered logit model to estimate the determinants of the aspirations gap since the SWB in the survey was measured with ordinal instead of cardinal values.

3.4 Data

As noted, this paper uses two waves (2007 and 2014) of panel data from the Indonesian Family Life Survey (IFLS), a high-quality panel survey of individuals, households, and communities. The survey contains information from more than 10,000 households representing about 83% of the Indonesian population, predominantly those who live in the 13 most populous of the nation's 26 provinces. The IFLS collected a broad array of demographic, socioeconomic, and health information, while capturing the cultural and socioeconomic diversity of Indonesia. Moreover, the re-interview rates of the original households (IFLS1) in IFLS4 (2007) and IFLS5 (2013) were 93.6% and 92%, respectively, and the risk of bias due to nonrandom attrition is very low in studies using the data. Importantly, the IFLS contains questions on subjective evaluations of respondents' happiness and living standards. The questions were asked to all household members 15 years and older. In particular, respondents were asked, "Which step are you on an imaginary six-step ladder where on the bottom stand the poorest group?" Similarly, respondents were asked on which step on the ladder they were at 5 years ago and expected to be in 5 years' time. They were also asked how happy they were overall. The four possible answers were very happy, happy, unhappy, and very unhappy. According to the data used in this study, the aspirations gap of 2007 is similar to that of 2014, although the gap is slightly higher in 2014 (Table 1). Another advantage of using this data set is that it includes extensive measures of health status, including measures of general health status, morbidity experience, and physical health assessments conducted by health workers with special training in taking such measurements. In the 2007 and 2014 waves of the IFLS, respondents were asked whether they had been diagnosed with a set of chronic conditions such as hypertension, diabetes, tuberculosis, asthma, cancer, arthritis/rheumatism, liver problem, kidney disease, depression, heart disease, and stroke. If they had been diagnosed with some chronic illnesses, they were further asked when they were first diagnosed and whether their physical activities were limited by those illnesses. In this paper, the variable of chronic illness is constructed based on this information. In the sample of this study, approximately 5% of adults have some types of chronic illnesses that a ect their ability to work and the mean duration of illnesses is 5.5 years. Table 1 reports the descriptive statistics for the dependent and explanatory variables used in this study.

Table 1 Definitions of variables and descriptive statistics

Abbreviation	Definition	2007		2014	
		Mean	SD	Mean	SD
Dependent var					
Aspirations gap	Gap in current and future (5 yr later) wellbeing (− 5;min, 5;max)	0.678	0.778	0.739	0.972
< 25 percentile	Bottom 25 percentile	0.675	0.764	0.989	1.012
> 25 percentile	Top 25 percentile	0.704	0.777	0.955	0.957
Subjective wellbeing	Subjective wellbeing on an imaginary ladder (-5 = min, 5 = max)	3.012	0.942	2.853	0.784
< 25 percentile	Bottom 25 percentile	2.677	0.787	2.830	0.998
> 25 percentile	Top 25 percentile	3.131	0.741	3.237	0.856
Happy	Happiness level (1 = very unhappy, 4 = very happy)	3.040	0.495	2.978	0.393
< 25 percentile	Bottom 25 percentile	2.944	0.399	2.970	0.521
> 25 percentile	Top 25 percentile	3.037	0.384	3.086	0.473
Personal					
Duration	Duration of chronic illness (patients)			5.457	7.010
Education	Level of education (1 = min, 4 = max)			9.812	3.209
Married	1 if married	0.313	0.440	0.425	0.494
Age	Age in years			31.29	11.57
Gender	1 if male			0.497	0.503
Family					
# of children	Number of children under 15	2.697	1.097	1.387	1.185
# of adults	Number of adults between 16 and above	2.798	1.810	2.779	1.778
Housing status	1 = self-owned 0 = not owned	0.491	0.499	0.673	0.496
Family income	Family income (ln)	14.81	4.664	18.71	9.738
< 25 percentile	Bottom 25 percentile	10.59	6.616	14.54	4.843
> 25 percentile	Top 25 percentile	17.50	0.539	24.67	2.997
Disaster	Number of natural disasters experienced by households	0.114	1.466	0.505	2.667

Table 1 (continued)

Abbreviation	Definition	2007		2014	
		Mean	SD	Mean	SD
Village					
Village income	Mean individual income of village	12.57	0.685	16.90	0.509
Urban	Urban area (1 = yes)			0.593	0.491

Source IFLS

4 Results

4.1 Effects of Chronic Illness on the Aspirations Gap

Table 2 shows the estimation results of three models that estimate the e ects of chronic illness on the aspirations gap using STATA. The first model estimates the e ects of chronic illness using an ordinary least squares (OLS) regression while the second model estimates the

Table 2 E ects of chronic illness on changes in the aspirations gap

	OLS	Fixed e ects	Ordered logit	Marginal e ects[a]
Duration	0.024**	0.019*	0.039**	0.005**
	(0.011)	(0.011)	(0.017)	(0.002)
Duration squared	− 0.001*	0	− 0.001**	− 0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Education	− 0.028***	− 0.013	− 0.035**	− 0.005**
	(0.011)	(0.012)	(0.017)	(0.002)
Age	− 0.009***	− 0.009***	− 0.016***	− 0.002***
	(0.001)	(0.001)	(0.002)	(0.000)
Gender (1 = male)	− 0.009	− 0.006	0.006	0.001
	(0.011)	(0.012)	(0.018)	(0.002)
Δ Marital status	0.025	0.026	0.032	0.004
(2007–2014)	(0.019)	(0.019)	(0.029)	(0.004)
Relative family income	(0.011)	− 0.016*	(0.014)	(0.002)
	(0.008)	(0.009)	(0.013)	(0.002)
Δ Relative family income	− 0.005	− 0.004	− 0.005	− 0.001
(2007–2014)	(0.006)	(0.006)	(0.009)	(0.001)
Δ # of children	− 0.007	− 0.006	− 0.009	− 0.001
(2007–2014)	(0.008)	(0.008)	(0.012)	(0.002)
Δ # of adults	− 0.002	− 0.005	− 0.003	− 0.001
(2007–2014)	(0.006)	(0.005)	(0.008)	(0.001)
Δ Housing status	− 0.032	− 0.031	− 0.034	− 0.004
(2007–2014)	(0.025)	(0.026)	(0.038)	(0.005)
Δ # of disasters	0.004	0.007*	0.008	0.001
(2007–2014)	− 0.004	− 0.004	− 0.006	− 0.001
Urban area	0.043*	0.006	0.054	0.007
	(0.023)	(0.082)	(0.035)	(0.004)
Δ Mean village income	0.003		0.006	0.001
(2007–2014)	− 0.008		− 0.013	− 0.002
Village fixed e ects	No	Yes	No	No
R^2	0.01	0.12	0.003	0.003
Obs	18,977	19,633	18,977	18,977

Dependent variable: changes in aspiration gaps between 2007 and 2014

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Standard errors are in parentheses. All standard errors were adjusted for within cluster

[a]The outcome is one for the change in the aspirations gap between 2007 and 2014

e ects controlling for village-fixed e ects. Accounting for the ordinal nature of the SWB variables, the third model employs an ordered logit to estimate the relationship between chronic illness and the aspirations gap. The marginal e ects of the covariates are reported in the last model. In all models, the dependent variables are changes in the aspirations gap between 2007 and 2014 while the explanatory variable of interest is duration of chronic illness.

The results show a significantly positive correlation between the duration of chronic illness and the aspirations gap in all models. That is, the aspirations gap of people with chronic illness is found to increase more than the mean increase in the aspirations gap between 2007 and 2014. The results are statistically significant in all models at the conventional $p < 0.05$ level except the second model, which is significant at the $p < 0.1$ level. As expected, the coe cient of duration in the OLS model is greater than that of the second model with village-fixed e ects, implying that the e ect of chronic illness is overestimated in the OLS model. The second fixed e ects model shows that a one-year increase in duration of illness is associated with an increase in the aspirations gap that is 0.06 scale points higher than the mean change in the gap. Taking into account the mean duration of chronic illness, we can expect people with chronic illness to experience a 0.33 scale point higher increase in the aspirations gap than the mean increase in the gap between 2007 and 2014. On the other hand, the significant coe cients on the square terms of duration in all models indicate that the aspirations gap increases nonlinearly. A simple calculation shows that the gap begins to decrease after 11 years of chronic illness.

While the results show an increase in the aspirations gap, the increase may occur for several reasons. It may occur as the reference point or the aspired level of future material wellbeing increases over the duration of chronic illness. The increase in the reference point may be justified in the context of psychology. For instance, individuals su ering chronic illness may want to have, as their coping strategies, wishful fantasies about future, which may be reflected in their aspirations gap. On the other hand, the increase in the aspirations gap may also occur as the current life evaluation deteriorates over the period of chronic illness while the reference point remains constant. To investigate more on the causes of this increase in the aspirations gap, the following sections explain the additional regressions run using other dependent variables that measure the current life evaluation and emotional wellbeing of individuals.

4.2 Effects of Chronic Illness on changes in the Aspired Level of Wealth

The aspirations gap in this study is constructed from the di erence between the current level of life evaluation and the aspired level of wealth 5 years later. The results reported in the previous section establish a positive relation between the duration of chronic illness and the aspirations gap. As a first step to examine the actual cause of the increase in the aspirations gap, this section runs additional regressions by replacing the dependent variable with changes in the aspired level of wealth. The dependent variable in this analysis utilizes the information about the aspired level of future wealth 5 years later measured in 2007 and 2014, respectively. Consistent with the previous section, Table 3 reports regression results from OLS, fixed e ects, and ordered logit models. According to the results, there is no evidence that chronic illness a ects the aspired level of future wealth. This implies that the reference point, the variable of interest typically in the field of psychology, is una ected by the duration of chronic illness between 2007 and 2014. The constant reference point, in turn, suggests that the increase in the aspirations gap is caused by a deterioration of current life evaluation. The following section further investigates this conjecture.

Table 3 E ects of chronic illness on changes in the aspired level of wellbeing

	OLS	Fixed e ects	Ordered logit
Duration	0.006	0.005	0.012
	(0.013)	(0.012)	(0.017)
Duration squared	0	0	0
	(0.000)	(0.000)	(0.001)
Education	− 0.006	0.008	− 0.001
	(0.012)	(0.014)	(0.016)
Age	− 0.012***	− 0.011***	− 0.018***
	(0.001)	(0.001)	(0.002)
Gender (1 = male)	0.056***	0.057***	0.083***
	(0.013)	(0.013)	(0.018)
Δ Marital status	0.02	0.029	0.018
(2007–2014)	(0.020)	(0.021)	(0.028)
Relative family income	− 0.01	− 0.018	− 0.01
	(0.011)	(0.012)	(0.016)
Δ Relative family income	0.014*	0.015*	0.021*
(2007–2014)	(0.008)	(0.009)	(0.012)
Δ # of children	− 0.001	− 0.006	0
(2007–2014)	(0.009)	(0.008)	(0.012)
Δ # of adults	− 0.001	− 0.005	− 0.001
(2007–2014)	(0.006)	(0.006)	(0.009)
Δ Housing status	0.048*	0.032	0.062*
(2007–2014)	(0.027)	(0.027)	(0.036)
Δ # of disasters	0.002	0.008*	0.005
(2007–2014)	(0.004)	(0.005)	(0.007)
Urban area	0.050*	− 0.024	0.066*
	(0.026)	(0.077)	(0.035)
Δ Mean village income	− 0.005		− 0.005
(2007–2014)	(0.010)		(0.013)
Village fixed e ects	No	Yes	No
R^2	0.01	0.12	0.003
Obs	18,977	19,633	18,977

Dependent variable: changes in aspired levels of wellbeing between 2007 and 2014

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Standard errors are in parentheses. All standard errors were adjusted for within cluster

[a]The outcome is one for the change in the aspirations gap between 2007 and 2014

4.3 Effects of Chronic Illness on Current Life Evaluation

Table 4 presents the regression results with the dependent variable replaced by the changes in the current life evaluation. Other explanatory variables remain the same except for the squared term of illness duration, which is now removed as it is not significantly associated with the dependent variable while the inclusion of the term lowers the value of R-squared in all models. Unlike the previous regression results with the aspirations gap variable, the

Table 4 E ects of chronic illness on changes in life evaluation

	OLS	Fixed e ects	Ordered logit	Marginal e ects[a]
Duration	− 0.010**	− 0.011**	− 0.017*	0.002*
	(0.005)	(0.005)	(0.009)	(0.001)
Education	0.024***	0.020*	0.055***	− 0.008***
	(0.009)	(0.011)	(0.016)	(0.002)
Age	− 0.003***	− 0.002*	− 0.006***	0.001***
	(0.001)	(0.001)	(0.002)	(0.000)
Gender (1 = male)	0.065***	0.063***	0.109***	− 0.015***
	(0.010)	(0.010)	(0.018)	(0.002)
Δ Marital status	− 0.005	0.003	− 0.013	0.002
(2007–2014)	(0.016)	(0.017)	(0.028)	(0.004)
Relative family income	0.001	− 0.002	0.007	− 0.001
	(0.009)	(0.009)	(0.016)	(0.002)
Δ Relative family income	0.018***	0.021***	0.031***	− 0.004***
(2007–2014)	(0.007)	(0.007)	(0.012)	(0.002)
Δ # of children	0.006	0	0.014	− 0.002
(2007–2014)	(0.007)	(0.007)	(0.012)	(0.002)
Δ # of adults	0.002	0	0.003	− 0.001
(2007–2014)	(0.004)	(0.004)	(0.008)	(0.001)
Δ Housing status	0.056***	0.038*	0.089**	− 0.012**
(2007–2014)	(0.020)	(0.021)	(0.035)	(0.005)
Δ # of disasters	− 0.002	0.001	− 0.002	0.001
(2007–2014)	(0.003)	(0.004)	(0.007)	(0.001)
Urban area	0.006	− 0.03	0.018	− 0.002
	(− 0.02)	(− 0.063)	(− 0.035)	(− 0.005)
Δ Mean village income	0.008		0.007	0.001
(2007–2014)	(0.007)		(0.013)	(0.002)
Village fixed e ects	No	Yes	No	No
R^2	0.01	0.11	0.003	0.003
Obs	18,977	19,633	18,977	18,977

Dependent variable: changes in subjective wellbeing between 2007 and 2014

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Standard errors are in parentheses. All standard errors were adjusted for within cluster

[a]The outcome is negative one for the change in the aspirations gap between 2007 and 2014

results in Table 4 show that the duration of chronic illness lowers the level of current life evaluation in all models. According to the fixed e ects model, a one-year increase in duration of illness leads to a reduction of life evaluation by 0.11 scale points. Or equivalently, considering the mean duration of illness, we can expect the life evaluation of people with chronic illness to be reduced by 0.6 scale points between 2007 and 2014. The reduction is statistically significant at the $p < 0.05$ level.

On the other hand, other control variables included in the models all show reasonable estimation results. In particular, among the variables included in the models, education, changes in relative family income, and changes in housing status are positively associated

with the changes in life evaluation in all models ($p < 0.05$). In contrast, age and being female appear to be negatively associated with changes in life evaluation ($p < 0.01$). Overall, considering the previous results that the future reference points are not a ected by chronic illness, we can conclude that the increase in the aspirations gap is caused by a decrease in current life evaluation over the duration of chronic illness.

4.4 Effects of Chronic Illness on Happiness

One important implication of the aspirations gap is that a higher aspirations gap may lead to discontent and frustration as individuals evaluate their material wellbeing relative to that of their cognitive neighborhood and to their future reference point (Ray 2006; Genicot and Ray 2017). Results in the previous sections show that chronic illness leads to a decrease in current life evaluation while the reference point is una ected. This implies that chronic illness may lower the emotional wellbeing as people with chronic illness experience an increasing disparity between their current situation and what they aspire to achieve over the duration of the illness. In this section, additional regressions are run to examine the e ect of chronic illness on emotional wellbeing.

Table 5 presents the regression results with the dependent variable replaced by the changes in happiness levels between 2007 and 2014. The results show that, consistent with general findings in the literature, the duration of chronic illness is negatively associated with changes in emotional wellbeing. In particular, according to the result from the fixed e ects model, a one-year increase in duration of illness is associated with a 0.11 scale points decrease in the happiness level. Or equivalently, people with chronic illness are expected to experience 0.6 scale points decrease in their happiness level between 2007 and 2014 ($p < 0.1$). Other control variables included in the models also all show reasonable estimation results. More specifically, the results imply that the level of happiness decreases as age and the number of natural disasters increase. In contrast, happiness is found to be positively linked to married status, female, and the current relative family income. The coe cients are significant at the 1% level in all models except the change in number of children. Interestingly, unlike the results from the life evaluation, the increase in relative family income does not lead to a higher happiness level, which seems to support the theory of hedonic treadmill (Easterlin 2001).

Overall, the results in this section support the proposition of the recent aspirations theory by Genicot and Ray (2017) in that the higher aspirations gap caused by chronic illness leads to discontent and frustration, which in turn lower the emotional wellbeing. In this sense, the findings shed light on the role of the aspirations gap as a socioeconomic mediator between chronic illness and emotional wellbeing.

4.5 Differential Effects of Chronic Illness by Income Group

The results so far support the conjecture that the duration of chronic illness increases the aspirations gap while reducing the level of emotional wellbeing. The link between the aspirations gap and the emotional wellbeing, however, demands further investigations to check the robustness of the results and derive socioeconomic implications. This section examines the di erential e ects of chronic illness by disaggregating the sample by income groups. Intuitively, low income households, with their limited access to formal insurance and credit markets, are likely to have a lower ability to cope with illness as they tend to

Table 5 E ects of chronic illness on changes in happiness

	OLS	Fixed e ects	Ordered logit	Marginal e ects[a]
Duration	− 0.005*	− 0.004*	− 0.018*	0.002*
	(0.003)	(0.003)	(0.011)	(0.001)
Education	0.008*	0.003	0.026	− 0.002
	(0.004)	(0.005)	(0.017)	(0.002)
Age	− 0.002***	− 0.002***	− 0.008***	0.001***
	0.000	0.000	(0.002)	(0.000)
Gender (1 = male)	− 0.013***	− 0.014***	− 0.062***	0.006***
	(0.005)	(0.005)	(0.019)	(0.002)
Δ Marital status	0.027***	0.027***	0.114***	− 0.010***
(2007–2014)	(0.007)	(0.007)	(0.029)	(0.003)
Relative family income	0.016***	0.015***	0.055***	− 0.005***
	(0.004)	(0.004)	(0.015)	(0.001)
Δ Relative family income	0.004	0.003	0.014	0.001
(2007–2014)	(0.003)	(0.003)	(0.012)	(0.001)
Δ # of children	− 0.005	− 0.006*	− 0.022*	0.002*
(2007–2014)	(0.003)	(0.003)	(0.013)	(0.001)
Δ # of adults	0	0.001	0	0.000
(2007–2014)	(0.002)	(0.002)	(0.009)	(0.001)
Δ Housing status	0.002	− 0.001	0.006	− 0.001
(2007–2014)	(0.009)	(0.009)	(0.035)	(0.003)
Δ # of disasters	− 0.005***	− 0.005***	− 0.020***	0.002***
(2007–2014)	(0.002)	(0.002)	(0.006)	(0.001)
Urban area	0.011	− 0.004	0.055	− 0.005
	(− 0.009)	(− 0.028)	(− 0.034)	(− 0.003)
Δ Mean village income	0.005		0.018	0.002
(2007–2014)	(0.003)		(0.013)	(0.001)
Village fixed e ects	No	Yes	No	No
R^2	0.01	0.10	0.01	0.01
Obs	18,977	19,633	18,977	18,977

Dependent variable: changes in subjective wellbeing between 2007 and 2014

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Standard errors are in parentheses. All standard errors were adjusted for within cluster

[a]The outcome is negative one for the change in the aspirations gap between 2007 and 2014

rely on private informal coping mechanisms such as drawing on savings and selling asset, especially in developing countries.[9] As a result, the poor are likely to experience a greater decrease in their current life evaluation and hence a greater aspirations gap, which lead to a deeper level of discontent and dissatisfaction as duration of illness increases. The claimed link between the aspirations gap and the emotional wellbeing would thus be supported if a

[9] Intra-household labor substitution is also an important coping strategy in households with sick adults in developing counties, but a recent study shows that such a coping strategy fails to insure farm profits against severe morbidity shocks in Indonesia (Lim 2017b).

Table 6 Di erential e ects of chronic illness by income group

	Aspirations gap[a]		Life evaluation gap[b]		Happiness gap[b]	
	< 25%	> 75%	< 25%	> 75%	< 25%	> 75%
Duration	0.010***	− 0.011*	0.004*	0.001	0.003**	0.001
	(0.004)	(0.006)	(0.002)	(0.003)	(0.001)	(0.003)
Duration squared	− 0.002***	0.001***				
	(0.000)	(0.000)				
Education	− 0.003	− 0.011***	− 0.007*	− 0.014***	0.001	− 0.008**
	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)
Age	− 0.001***	− 0.003***	0.001***	0.001	0.001***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Gender (1 = male)	− 0.001	0.001	− 0.025***	− 0.010**	0.011***	0.004
	(0.004)	(0.004)	(0.004)	(0.005)	(0.003)	(0.004)
Δ Marital status	0.004	0.011*	0.007	− 0.001	− 0.02***	− 0.02***
(2007–2014)	(0.005)	(0.006)	(0.006)	(0.007)	(0.005)	(0.006)
Relative family income	0.015	0.004	− 0.004	− 0.000	0.048***	− 0.004*
	(0.017)	(0.002)	(0.020)	(0.003)	(0.017)	(0.002)
Δ Relative family income	− 0.018	− 0.001	− 0.008	− 0.002	− 0.05***	0.002
(2007–2014)	(0.017)	(0.002)	(0.020)	(0.002)	(0.016)	(0.001)
Δ # of children	− 0.004	− 0.002	− 0.005	− 0.004	0.007***	0.003
(2007–2014)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Δ # of adults	0.001	0.000	− 0.003	0.001	− 0.001	0.001
(2007–2014)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Δ Housing status	0.003	− 0.001	− 0.004	− 0.014*	− 0.009	− 0.017**
(2007–2014)	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)
Δ # of disasters	0.001	0.000	− 0.002	− 0.001	0.002**	0.002
(2007–2014)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
Urban area	0.015**	0.004	− 0.005	− 0.001	0.004	− 0.006
	(0.006)	(0.008)	(0.007)	(0.009)	(0.006)	(0.007)
Δ Mean village income	− 0.003	− 0.004	− 0.003	0.004	0.005**	0.003
(2007–2014)	(0.002)	(0.003)	(0.003)	(0.004)	(0.002)	(0.003)
Pseudo R^2	0.01	0.10	0.01	0.003	0.01	0.01
Obs	4946	4458	4946	4458	4946	4458

Figures outside parentheses are marginal e ects estimated by ordered logit models

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$. Standard errors are in parentheses. All standard errors were adjusted for within cluster

[a]The outcome is positive one for the change in the aspirations gap

[b]The outcome is negative one for life evaluation and happiness gap

greater impact of illness duration is found on their aspirations gap and emotional wellbeing in a lower income group. For this analysis, each regression is run with two separate income groups using an ordered logit model. The low income group is selected from the family income of the bottom 25 percentile while the high income group is composed of households with the top 25 percentile of family income in the sample.

The regression results are presented in Table 6, where the first two models use changes in the aspirations gap as dependent variables while the next two models use changes in

current life evaluation and happiness, respectively. All the estimates are marginal e ects derived from the ordered logit models. According to the results, the aspirations gap increases only in the poor income group while the rich income group shows a decrease in the aspirations gap as the duration of chronic illness increases between 2007 and 2014. The results are significant at the $p < 0.01$ and $p < 0.1$ level, respectively. Moreover, the marginal e ect of the low-income group becomes twice larger than that of the full sample reported in Table 2, implying that the e ects of chronic illness are greater among the poor. On the other hand, the marginal e ects on the changes in life evaluation show that only the poor experience a deterioration in life evaluation, and the magnitude of the e ect is twice larger than that of the full sample reported in Table 4. The marginal e ects on the changes in happiness also show similar results. In particular, the probability of reporting a one-step lower level of happiness for the poor is 50% greater than that of the full sample, and the result is significant at the $p < 0.05$ level. In contrast, the illness duration of the rich is not significantly associated with the changes in happiness. The results are consistent with the conjecture that chronic illness has more detrimental e ects on the subjective wellbeing of the poor. Overall, again, the results support the view that the link between chronic illness and a lower emotional wellbeing is explained by the increasing aspirations gap over the duration of chronic illness.

5 Discussion

This paper investigates the relationship among chronic illness, aspirations, and emotional wellbeing in Indonesia. One variable of special interest is the aspirations gap, which is constructed from a di erence between one's future reference point and current life evaluation. The results find a significant role of the aspirations gap as a socioeconomic mediator between chronic illness and emotional wellbeing. Individuals with chronic illness are found to have lower levels of emotional wellbeing as their aspirations gaps increase. The results suggest that individuals su ering chronic illness undergo evaluative processes of their current living standards relative to their cognitive neighborhood and to their future reference points in Indonesia. Furthermore, the deterioration of emotional wellbeing appears to occur as long-term chronic illness induces the patients to perceive a deterioration of their subjective wellbeing relative to others in their aspirations window.

The findings of this paper present meaningful implications to the literature across academic disciplines. First of all, this study identifies a socioeconomic mechanism by which chronic illness a ects emotional wellbeing. The results imply that chronic illness negatively a ects the way individuals view their current standard of living or quality of life relative to others and to their future reference points, resulting in a deterioration of emotional wellbeing. This finding is also consistent with the socially-determined aspirations theory that an excessive aspirations gap leads to discontent and frustration as individuals compare their wealth with the living standards of others in their aspirations windows (Ray 2006; Genicot and Ray 2017).

Secondly, the results of this study present empirical evidence that chronic illness may be linked to underinvestment in Indonesia as the aspirations gap increases over the duration of illness. Recent studies have established the linkage between aspirations failure and underinvestment either theoretically or empirically (Bernard et al. 2011; Macours and Vakis 2014; Mekonnen and Gerber 2016; Genicot and Ray 2017), yet the empirical evidence is still rare to support this claim. This paper contributes to this literature by showing that the

duration of chronic illness raises the aspirations gap while lowering the emotional wellbeing, which in turn may be linked to underinvestment and intergenerational transmission of poverty. The poor with chronic conditions may have little incentive to raise their living standards due to frustrated aspirations, although they can expect greater pecuniary returns later from their investment in children's human capital in Indonesia.[10] This view is supported by the additional regression results that show a greater impact of illness duration on the aspirations gap and emotional wellbeing of individuals in the bottom 25 percentile of household income, who are more vulnerable to health shocks in Indonesia. In this sense, this study also contributes to the recent literature that examines the e ects of parental illness on schooling of children as it reveals a potential channel through which chronic illness of parents a ects schooling of children. Existing studies on parental illness and schooling of children have paid no attention to the role of aspirations failure as a mediator (Bratti and Mendola 2014; Alam 2015).

Lastly, this paper also provides meaningful findings to the related literature on psychological adjustment to illness. Chronic illness may represent an experience that can interfere with treasured life goals or plans that bring meaning to life, hence negatively a ecting future goals or reference points. On the other hand, from another perspective in psychology, chronic illness may have the opposite e ect on the aspired level of wealth as individuals with chronic conditions adopt positive thinking or wish-fulfilling fantasies as a coping strategy. However, the results in this paper find no evidence that reference points are altered by the duration of chronic illness, which is somewhat surprising. To further identify the direction of the e ect, one may need to disaggregate the sample by individual attributes and circumstances such as personality, types of illness, and socioeconomic status. Nevertheless, the findings suggest that the future reference points or life goals of individuals suffering long-term illness remain stable, while their evaluations of current material wellbeing become worsened. They further suggest that it is this gap between the current life evaluation and the future reference point that matters more in a psychological adjustment process to chronic illness. Future work could usefully explore further the adjustment process focusing on the aspirations gap, using di erent samples in a di erent institutional setting.

6 Conclusion

Studies across disciplines have shown that chronic illness and emotional wellbeing are closely related. Yet, the literature has paid little attention to the mediators of the relationship especially from a socioeconomic perspective. Using two waves (2007 and 2014) of longitudinal Indonesian data, this study fills this research gap by shedding light on the role of the aspirations gap as a mediator of the relationship between the duration of chronic illness and emotional wellbeing. This issue is far from being trivial as chronic illness may lead to intergenerational transmission of poverty via aspirations failure in many developing countries, where the burden of chronic illness is greater than in developed countries. Overall, the results of this paper suggest that chronic illness leads to frustration and despair as the aspirations gap becomes greater between the future reference point and current life evaluation, compared to the living standards of an individual's cognitive neighborhood in Indonesia.

[10] The duty of taking care of older parents tend to belong to sons in developing countries in Asia.

The findings of this paper are of special interest to policy makers in that they identify non-pecuniary costs of chronic illness in terms of income inequality and intergenerational transmission of poverty in Indonesia. In particular, they show that chronic illness brings about a vicious cycle in which the rising aspirations gap caused by the illness reinforces feelings of unhappiness especially in the poor households, who are more vulnerable to health shocks in Indonesia. The results also imply that chronic illness of the poor may lead to underinvestment in their children's human capital via the channel of the rising aspirations gap accompanied by frustration. Likewise, the results also suggest that the e ects of chronic illness may be greater in communities where the income inequality is severer as individuals are likely to experience greater aspirations gaps than others living in communities with a narrower income distribution. The findings suggest that benefits of government expenditures on healthcare may be greater when the government, with its limited resources, targets subsidies towards low-income people with long-term illnesses especially in regions where the Gini coe cient is greater. They also suggest that health care systems should be concerned not only with illness and disability, but also with supporting methods of improving psychological states over the period of illness.

As a final remark, the results of this study should be interpreted with caution. This paper employs multiple empirical models and attempts to estimate the causal e ects of chronic illness on aspirations and subjective wellbeing by controlling for fixed e ects. Nevertheless, they are unlikely to be completely immune to the biases associated with unobserved idiosyncratic confounding factors. The investigation of the causal link between the aspirations gap and the emotional wellbeing is not complete either, although this paper presents evidence that supports the link between the two variables. The construction of the aspirations gap variable is also based on a self-reported forecast for future wealth 5 years later, so there may be biases associated with some measurement errors. Further research is clearly needed to address these limitations. Moreover, the findings of this study suggest that parental chronic illness may a ect the children's human capital investment via the channel of the aspirations gap, but this linkage has not been directly explored. This paper has opened avenues for future work on this important linkage.

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