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Long panel studies of small-scale rural societies in the Global South: What is their value, why are they rare, and suggestions to make them happen

Jonathan Bauchet^a, Ricardo Godoy^{b,*}, William R. Leonard^c, Victoria Reyes-García^d, Asher Y. Rosinger^e, Susan Tanner^f, Eduardo A. Undurraga^g

^a Department of Agricultural Economics, Purdue University, West Lafayette, IN 47907, USA

^b Heller School for Social Policy and Management, Brandeis University, Waltham, MA 02453, USA

^c Department of Anthropology and Program in Global Health Studies, Northwestern University, Evanston, IL 60208, USA

^d Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain and Institute of Environmental Science and Technology and Departament d'Antropologia Social i Cultural, Universitat Autònoma de Barcelona 08193, Cerdanyola del Valles, Barcelona, Spain

^e Department of Biobehavioral Health and Department of Anthropology, Pennsylvania State University, University Park, PA 16802, USA

^f Department of Anthropology, University of Georgia, Athens, GA 30605, USA

^g Escuela de Gobierno Pontificia Universidad Católica de Chile, Santiago 7820436, Chile

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ABSTRACT

Many topics in the behavioral sciences and epidemiology require researchers to directly observe entities (e.g., individuals, households) over a long time to identify lasting effects. Long-term panel data collection is more common in high-income countries than in small-scale rural societies (SSRS) of low-income countries. SSRS are mobile, nature-dependent, linguistic minorities, and highly autarkic. Analyzing such data using a life-course perspective can help uncover patterns that align or upend what we know from high-income countries. This study a) reviews long (>10 year) panels in SSRS ($n = 9$), b) extends the analysis to cover somewhat comparable societies of smallholders ($n = 7$) who are less autarkic, and c) draws on annual panel data (2002–2010) from one SSRS in the Bolivian Amazon (Tsimane') to illustrate how adult life-course patterns may vary but also resemble patterns in high-income countries. In general, panels have focused more on human biology than on socioeconomic outcomes, have gathered data at irregular intervals, and have not deposited datasets in public repositories. Compared with people in high-income countries, Tsimane' were similar in the amount of intragenerational immobility at the very top and the very bottom of the income and wealth distribution. In both places, body weight rose while sociality frayed over time. Yet Tsimane' differed in having more economic mobility outside the top and bottom income and wealth distribution, a slightly higher growth rate in economic inequality, and no correlation between economic mobility and age. We identify institutional and individual hurdles to collecting panel data in SSRS and discuss steps to overcome them.

1. Introduction

Many topics central to the behavioral sciences, public health, and medicine require following multiple individuals, households, and communities over a long time. Longitudinal designs are essential for a life course perspective, which examines how experiences accumulate and interact across stages of life. Examples span growth and development (Blume & Lust, 2017; Cameron & Schell, 2021; Dasré et al., 2019; Malina, 2004; Vigezzi et al., 2025), fertility (Hayford, 2009), health (Wagner et al., 2024), cumulative disadvantage (Huoyun et al., 2023,

Lowe et al., 2020), socioeconomic dynamics (Shi & Gugushvili, 2025), and savings and consumption (Browning & Crossley, 2001). High-income countries have traditions of using longitudinal data and a life course perspective to study these topics chiefly in the general urban population and, to a lesser extent, in rural ethnic minorities (Dodson et al., 2012; Shephard & Rode, 1996), but comparable efforts in the Global South are rarer. Thus, we know much less about life course dynamics in the Global South and, within the Global South, relatively little about the life course of people in highly self-sufficient (autarkic), nature-dependent, small-scale rural societies (Borgerhoff Mulder, 2021;

* Corresponding author at: Heller School for Social Policy and Management, Brandeis University, 415 South St, Waltham MA 02453, USA.

E-mail addresses: jbauchet@purdue.edu (J. Bauchet), rgodoy@brandeis.edu (R. Godoy), w-leonard1@northwestern.edu (W.R. Leonard), Victoria.reyes@uab.cat (V. Reyes-García), arosinger@psu.edu (A.Y. Rosinger), stanner1@uga.edu (S. Tanner), eundurra@uc.cl (E.A. Undurraga).

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Minocher et al., 2024; Urlacher et al., 2026). We recognize there are small-scale rural societies in high-income countries (e.g., Inuit, Amish, Sámi) that are also under-represented in science, but our focus is on small-scale rural societies in low-income countries of the Global South.

Life-course dynamics in small-scale societies of the Global South are important because these societies are undergoing rapid ecological, technological, epidemiological, and socioeconomic transformations. These transformations might reveal both positive outcomes, such as adaptation, resilience, and developmental plasticity, and negative outcomes, such as dispossession, inequality, and heightened vulnerability to climate change. Bringing global science life-course data from small-scale societies into the fold could uncover patterns that align with or upend what we know from high-income countries. Recent years have seen a surge of research across disciplines to test hypotheses with cross-sectional data from both high-income countries and small-scale societies (Broesch et al., 2020). Some of those results defy the belief that Western psychology represents universal human nature (Apicella et al., 2020; Fuentes, 2017; Henrich, 2020). Small-scale societies offer a valuable lens through which to examine how humans adapt to changing social conditions and how far previously adaptive genotypes interact with changing environments to affect health (Lea et al., 2023). On a practical level, tracking individuals in these contexts as they navigate socioeconomic and environmental disruptions allows researchers to identify persistent disadvantages and to understand how vulnerabilities, adaptive strategies, and resilience emerge, accumulate, and evolve over time. The knowledge gap reflects design constraints: a quantitative understanding of the life course requires panel data, i.e., repeated, systematic measurements of the same individuals, households, and communities over many years.

The article has five aims: 1) to briefly review the history of major long panels in high-income countries and describe the current worldwide distribution of panels and their themes; 2) to inventory and characterize long panel studies in small-scale societies and to extend the analysis and do the same among smallholder societies since they share many characteristics with small-scale societies but also differ in important ways; 3) to use a case-study of one small-scale rural society of Indigenous People in the Bolivian Amazon (Tsimane') to compare aspects of their life course with those of people from high-income countries; 4) to identify institutional and individual hurdles to the collection of long panel datasets in small-scale rural societies of the Global South; and 5) to discuss steps to overcome the hurdles.

2. Definitions, unique value of panels, and boundaries

2.1. Definitions

Despite their frequent use as synonyms, the words longitudinal and panel have slightly different meanings. A longitudinal dataset is a quantitative or qualitative body of information that arises from following many people, households, or communities over multiple time points. In contrast, a panel is a type of longitudinal study based chiefly on direct quantitative measurements of the same units or entities (e.g., individuals, households), at multiple times.

We stress direct measurements of the same units to distinguish what we are calling a *classic* panel from what the literature calls a *synthetic* panel, which is made by stacking average answers about the same topic from different cross-sectional surveys done at different times with individuals from the same population, but not necessarily with the same individuals (Deaton, 1985; Guillermin, 2017; Ray & Genicot, 2023). The emphasis on following many entities helps to distinguish a panel from a *time series*, which follows only one entity. We emphasize following the same individuals to distinguish the *classic* panel we have in mind from a panel formed from a cross-sectional study, which asks individuals to recall past events (Mayer, 2008). The stress on following the same individuals over time also helps to distinguish a *classic* panel from a *rotating* panel, which follows the same individuals but intentionally

replaces some with a new sample as the panel evolves (Bailar, 1989; Menard, 2008, pp. 3-12). *Classic* and *rotating* panels can overlap and be equally useful for studying life course dynamics if the rotating panel includes a core of study participants followed regularly, supplemented by participants brought in and out of the panel. A *classic* panel study is synonymous with what in public health and medicine is called a *prospective cohort study*; those studies follow people to monitor the relationships between risk exposure and health (Capili & Anastasi, 2021).

By a *small-scale rural society*, we mean a society where people subsist mainly on hunting, gathering, pastoralism, fishing, slash-and-burn farming, or a combination of these (Reyes-García et al., 2017). These societies exist in both high-income and low-income countries but we focus on the latter because they are less likely to be part of the market economy and be influenced by globalization. In the Global South, they tend to be ethnic and linguistic minorities, endogamous, acephalous, relatively autarkic, but have a flexible and wide network of social relations (Bird et al., 2019; Glowacki & Lew-Levy, 2022). Although our principal focus lies with the life course in small-scale societies because it is likely to reveal the sharpest contrast with the life course of people in large national economies, we broaden the analysis to include smallholder farmers (hereafter *smallholders*) or rural producers in low-income countries who are often referred to as peasants (Narotzky, 2016). Like members of small-scale societies, smallholders have a diversified livelihood portfolio that includes more than farming, such as hunting, gathering, and fishing, but they differ because they are more integrated into the marketplace and national society and are more hierarchical. We follow the IMF (2023) income classifications and use Global South/North as shorthand for low/middle-income and high-income countries (Khan et al., 2022).

2.2. Unique value of panels

Panels have three undisputed values for academic researchers and policymakers. First, only panels enable the analysis of intragenerational dynamics through direct observation. Panels are required to estimate accurately within-unit rates of change in human biological outcomes, cognitive outcomes, socioeconomic variables, and other topics mentioned before. Only a panel can identify who falters, who recovers, who moves ahead of the curve, and who converges to the rest of the group (Borgerhoff Mulder, 2021), all important topics in understanding the human condition and in policy making. The second unique value of panels is their ability to remove time-invariant traits when estimating the effect of a time-varying predictor on a time-variant outcome; this advantage applies to people, households, communities, and nations (e.g., Forbes, 2000). Third, sequential panels from the same population permit separating cohort from life cycle (age) effects and their interactions (Hughes et al., 2021).

2.3. Boundaries

We limit the review in three ways.

- In line with criteria in several disciplines, we use a span of about ten years to define a long panel (Berman, 2022; Foster et al., 1979; Hoddinott et al., 2013; Jantti & Jenkins, 2015; Naschold & Barrett, 2011). The annual panel used as a case study for Aim 3 took place over nine years (2002–2010).
- We include only panels relying on observational data and leave aside randomized control trials (Glennester & Takavarasha, 2013) even if they followed people over a long time (Hamory et al., 2021; Ramirez-Zea & Mazariegos, 2020; Varghese et al., 2021). We do so because life course dynamics from trials could be affected by the interventions in the trial and, thus, would not be comparable to those from regular panels conducted under non-experimental conditions.
- The focus on long panels does not mean we diminish the value of short panels of a few months or a few years. Notably, shorter panels

are befitting in small-scale rural societies to 1) evaluate the effects of seasons on diet (Golden et al., 2019), extreme weather events (Rosinger et al., 2023; Starkweather et al., 2023), and policy changes (Marshak et al., 2021; Prall & Scelza, 2023) and to 2) assess pubertal changes (Glass et al., 2024; Nepomnaschy et al., 2004), short-term child growth (Urlacher et al., 2018; Wilunda et al., 2024), and the stability of cooperation over time (Smith et al., 2018). Nevertheless, we exclude them because they lack the scope to analyze long-term life course dynamics. Long panels can cover various combinations of childhood, adolescence, and adulthood; the comparative analysis of life course patterns discussed later (Aim 3) centers on adulthood.

d) We exclude panels in the Global South done by national governments alone or in cooperation with international organizations because those panels typically aim for national representativity by focusing on city dwellers and/or rural households participating in the marketplace, not on small-scale rural societies. Some of the best-known examples of such panels include the Ethiopian Rural Household Survey (Dercon et al., 2005), IFPRI's Bangladesh Rural Household Survey (Ahmed et al., 2023), the China Family Panel Studies (Xie et al., 2018), the Indonesia Family Life Survey (Witoelar et al., 2012), the Chitwan Valley Family Study in Nepal (Axinn, 2015), and the World Bank's Living Standards Measurement Study-Integrated Survey on Agriculture (LSMS-ISA), which covers eight rural areas of sub-Saharan countries (Usman & Haile, 2022). In contrast, we include (but discuss separately) long panels of smallholders in the Global South conducted by individual researchers or small teams.

3. Aim 1: Brief history of long panels in high-income countries and current worldwide patterns of panel studies

3.1. History

Panel studies have their deepest roots in practices by nurses, physicians, and school personnel in the USA at the turn of the twentieth century. At that time, these professionals began to record the weight and health of disadvantaged children as part of surveillances to prevent the spread of disease, attempts to educate families about hygiene and nutrition (Stern et al., 2010), and efforts to establish “well-baby clinics” where mothers with healthy children could come for regular checkups of their offspring (Weaver, 2010). The spark for gathering panel data came from the need to offer health services to European immigrants moving into poor urban neighborhoods in the Northeast. In a review of the early panels, Sontag (1971) found they were criticized at the time for being expensive, descriptive, coarse, and short on publications. On the positive side, they were interdisciplinary and committed to understanding how the natural and social environment shaped the total health of children as they matured (Roche, 1992).

From these roots, panel studies grew slowly in the USA and spread overseas. In 1929, the Fels Longitudinal Study in Yellow Springs, Ohio, began to follow children to assess the effects of the Great Depression on their health (Roche, 1992). A decade later, in 1938, in tandem with progressive legislation of the time (e.g., New Deal), the Harvard Study of Adult Development began garnering health and lifestyle data from 268 sophomore men at Harvard college in Cambridge, Massachusetts, to understand not so much “what made people sick, but what made them thrive” (Waldinger & Schultz, 2023, pp. 3, 11). In the same year, the Framingham Heart Study started monitoring cardiovascular health among adults in the nearby town of Framingham, Massachusetts. Impetus for the Framingham Heart Study came from the poor cardiovascular health of President Franklin D. Roosevelt and from “his premature death from hypertensive heart disease and stroke in 1945” (Mahmood et al., 2014, p. 999).

No new major panels appeared in the USA for about two decades. By 1957, the Wisconsin Longitudinal Study began to follow the aspirations, achievements, and socioeconomic conditions of high school graduates

from Wisconsin (Sewell et al., 2003). During the mid-1960s, panels started to spread outside the USA. In 1967, the Whitehall Study started to follow the health and socioeconomic conditions of civil servants in the UK (Clark, 2021). A year after the beginning of the Whitehall Study, researchers at the University of Michigan launched the Panel Study of Income Dynamics (PSID) to examine changes in the standards of living of households across social classes in the USA (Pfeffer et al., 2020). Other major panels followed soon thereafter, like the epidemiological Longitudinal Study of the Office of National Statistics in the UK in 1974 (Shelton et al., 2019), the economic National Longitudinal Study of Youth in the USA in 1979 (Aughinbaugh et al., 2015), and the German Socio-Economic Panel (SOEP) in 1984 (Goebel et al., 2019).¹

In sum: a) The first panels came not only from high-income countries, but from affluent places in those countries, like Massachusetts, Wisconsin, and London, and, as in the case of the Harvard study, from highly educated people unrepresentative of the general population. b) Panels have older and thicker roots in human biology (e.g., tracking blood pressure) than in social or economic aspects (e.g., tracking income). All the panels mentioned in this section covered aspects of human biology, but strong interest in social and economic aspects came later.

3.2. Current worldwide patterns

Although the number and quality of panel datasets from the Global South have risen in the past 25 years (BREAD, 2025; Durrant & Menken, 2002; Harpham et al., 2003), most panels continue to come from high-income countries and center on health. A consortium of institutions in the UK has been identifying and cataloguing all active and finished panels based on observational data (Arseneault, 2023). By mid-2025, the Atlas of Longitudinal Datasets had identified 3608 panel datasets worldwide and catalogued 2375 of them, of which 36% (n = 870) came from the Global South and, of these, 4% (n = 34) came from societies that practiced some type of farming, fishing, or hunting, but only two panels came from a small-scale society.² The current inventory undercounts the number of panels because it is a work in progress, initially centered on health and the Global North, with plans to expand to other topics and regions. Despite its limitations, the sample size of studies in the catalogue is large, and its breakdown by regions and the livelihood of study participants is telling.

4. Aim 2: Methods, inventory, and examples of long panel studies in small-scale societies

4.1. Methods

Our inventory came from prior literature reviews of panels in small-scale rural societies (Gravlee et al., 2009), searches in Scopus and Google Scholar, and from our personal knowledge of researchers currently conducting panel studies. We characterize each panel along the following dimensions: place, years covered, age of study participants, outcomes, baseline sample, attrition rate, primary subsistence strategy,

¹ Bynner (2016, pp. 51-54) provides an inventory of panel studies in high-income countries from 1946 until 2010 and Bogin (2021, pp. 48-63) provides a historical overview of panel studies on human growth done in the USA, Europe, and the Global South.

² Using the publicly available web page of the Atlas (<https://atlaslongitudinaldatasets.ac.uk>) in August 2025, we filtered all the datasets (n=2375) by region (East Asia and Pacific, Latin American and the Caribbean, Middle East and North Africa, South Asia, and Africa) and found 870 datasets from the Global South. In parallel, we searched manually for various spelling of farming (n=29), hunting (n=1), fishing (n=4), and pastoralism or herding (n=0) provided the panels came from countries in the Global South. This search yielded a total of 34 datasets. The only two studies that seemed to come from a small-scale society from the keyword search included the two studies included in Table 1 (C1A and C2).

Table 1

Long panel studies of small-scale societies.

Study name and status	Country	Societies	Cohort age	Years & frequency (t)	Baseline sample	Attrition	Outcome	Time-varying covariates	Data for public use & (# of requests)
<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	<i>VII</i>	<i>VIII</i>	<i>IX</i>	<i>X</i>
[A] Human biology and health									
[A1] Solomon Islands (SI)	PNG, SI	Nasioi ^b , Nagovisi, Aita, Lau, Baegu, Kwaio, Ulawa, Onton Java	0–19 y	1966–72 & 1985–86 (2)	1710i	34%	Lipids	Anthropometrics ^a	NA; see notes; (2)
[A1a]				1966–72,	294i	45%	BMI	Anthropometrics ^a	
[A1b]				1978–80,			Blood pressure	Age, muscle, adiposity, height	
[A2] Longitudinal study of Dogon in Mali* [A2a]	Mali	Dogon (urban & rural)	0–5	1999, 2000, 2004, 2007 & yearly 2010–2019	832i	18%	Placental malaria	Age, residence, bio-medical variables, wealth, survey date	ICPSR (19)
				1998–2000, '04, 2007, 2010	1700i	16% mean/year	Death, growth	Age, year, wealth, polygyny	NA
[A3] Daasanach (pastoralist) Human Biology Project*	Kenya	Daasanach	All	2019, 2022–25; on going	242 adults, 132 children (2–9)	52%	Anthropometry; food and water insecurity; blood pressure; kidney function	Age, household size, SES, milk intake, # of times surveyed	NA
[A4] THLHP*	Bolivia	Tsimane'	21+; all	2009–17 (3)	80 men i; 1c	15%	Cooperation/status	Status/cooperation	GitHub (NA)
[B] Socioeconomics									
[B1] Gwembe	Zambia	Tonga	All	1956/7, 1962/3, 1972/3, 1981/2, 1978/8, '92 (6)	10000i, 4c	NA	Demography ^a	Survey data ^b	Demography; (0)
[B2] Northern Ecuador Amazon Study	Ecuador	5 Indigenous Amazonian societies	Household-level; household heads surveyed	2001 & 2012 (2)	483 hh	Not available	Land use and crops	Schooling, age, soil quality	NA; see notes
[C] Hybrid: socioeconomics, human biology, health, environment									
[C1] HIARA*	Madagascar	Vezo, Masikoro	All	2022-present; planned every 3 months	14c, 450 h, 1168i	5%–25%	Mental health, nutrition, fish biomass	None	NA
[C1a] MAHERY	Madagascar	Betsimisaraka & Tsimihety	0–74	2004–2012	2c, 91 h, 719i	14%	Health, diet	Diet, natural resources, SES	Notes
[C2] TAPS	Bolivia	Tsimane'	All	2002–10; annual (9)	1453i, 240hh, 13c	2.5%	Many bio-social	Wide range	ICPSR and other places; (>100)

Notes: i = individuals, h = household, c = communities. Column I = * means that the study is in progress. In the notes below we include as an example one publication from the panel. Column III = primary subsistence strategy of most households. Smallholders implies farming. Column X = number of requests by third parties unaffiliated with the study. NA = not available because we could not find the information in publications and researchers did not answer our requests to provide the missing data.

[A] Human biology and health

[A1] [Weitz et al. \(2014\)](#). a = Baseline height-for-age and BMI-for-age z scores and subscapular skinfolds. b = The baseline survey dates of the eight societies differed; two were done in each of the following years: 1966, 1968, 1970, and 1972, making it an unbalanced panel. 1710 children 0–19 years of age were measured between 1966 and 1972, of whom 572 provided usable lipid data (p. 552). Jonathan Friedlander, Department of Anthropology, Temple University makes the data available to qualified users. The study is described and summarized in [Friedlaender et al. \(1987\)](#).

[A1a] [Weitz et al. \(2012\)](#). a = Baseline height-for-age z score.

[A1b] [Page and Friedlaender \(1987\)](#).

[A2] [Vincenz et al. \(2022\)](#). Attrition refers to total loss from 1999 until 2019.

[A2a] [Strassmann \(2011\)](#).

[A3] Researchers did a spring/rainy season wave in 2025 and expanded the sample to ~ 600 adults in summer 2025. Besides food insecurity researchers also measured water insecurity. The 52% attrition is not entirely accurate because they are using a panel with new samples added. Attrition between waves varied from 16.8% to 35.2% ([Rosinger et al., 2025](#)).

[A4] Tsimane' Health and Life History Project (THLHP) ([Gurven et al., 2017](#)). The information for the table comes from [von Rueden et al. \(2019\)](#). The age bracket for the study includes people ≥ 21y, but in some of the other studies they examine infants. We placed THLHP under the Health group because it is foremost a study of aging, but it also covers some socioeconomic aspects as in the study summarized in this table. THLHP is in progress and though the dataset for this and other articles are publicly available, access to other datasets (e.g., individual-level biomarkers) is restricted due to human subject concerns ([Kraft et al., 2020](#)).

[B] Socioeconomics

[B1] Clark et al. (1995). a = Demography = dates of birth, marriage, death, divorce, and migration. b = Wealth and education are coded, but, as far as we know, are still not available to the public.

[B2] Gray and Bilsborrow (2020). Four of the 36 communities were not surveyed in 2012 because of logistical reasons and migration; the authors did not report the number of households in the communities, but they included households that split off. Data is not available to the public due to concerns about protecting the anonymity of study participants.

[C] Hybrid

[C1] Health Impacts of Artificial Reef Advancement (HIARA in the Malagasy language). Located in western Madagascar, the study started in 2022 and is scheduled to continue until 2028. Golden et al. (2024) describe the study protocol. Attrition has varied by years (Christopher Golden, personal communication). The study was designed as a natural experiment to measure the impact of rehabilitating coral reefs on human nutrition and health and fish biomass in relation to the distance from communities to the coral reef.

[C1a] The Madagascar Health and Environmental Research (MAHERY) (Golden et al., 2017). Attrition at endline computed as people who left for schooling (57) or other reasons (47) or who died (2) as a share of baseline sample (719).

[C2] Godoy (2025). In a year, a median of eight people left the panel because they died; they represented 0.45% of the entire sample. Another 3.75% left permanently for other reasons beside death while 1.34% left but returned. The clean panel shows that of all adults during the nine years, 2.5% left permanently after the first survey in 2002 and 58% were always present after they were first surveyed. Excluding the 2.5% who left after 2002, the rest of the adults were absent an average of only one time in all the years they were surveyed.

and public availability of data. For each study, we include a reference, which is not necessarily the most representative, but in most cases had the information to fill out the tables. The results of the inventory are shown in Tables 1 and 2. Table 1 includes small-scale societies ($n = 9$), and Table 2 includes smallholders ($n = 7$). Within each table we group panels by whether they were primarily focused on health or socioeconomic aspects, or both.

We mention three caveats before turning to the results. First, as noted, the boundary between a small-scale rural society and smallholders is blurry. For instance, the sample for study C1 (Table 1) contained fishers and smallholders. A reader who is uncomfortable with the distinction can ignore it and focus on all the results or only on Table 1. Second, we noted earlier that 10 years is often used to define a long panel, but in the inventory, we included some shorter panels because they were near the 10-year limit. Third, we included one study that gathered repeated data from some of the same people over time but was never analyzed as a panel. Instead, data were amalgamated into one observation per study period, and what could have been a panel study was turned into a time-series analysis of a single population over time (Table 1, B1).

4.2. Inventory

Small-scale societies (Table 1). The table shows nine noteworthy findings.

- 1) Panel studies are recent. The Gwembe (B1) and the Solomon Islands panels (A1) began in the 1950s and 1960s, but all the others started at the turn of the twenty-first century.
- 2) They are also rare. We found only nine panels, of which four continue (A2, A3, A4, C1), all but one (A4) in Africa.
- 3) Unlike long panels from high-income countries, panels from small-scale societies focused on both health and socioeconomic outcomes. The nine panels were almost evenly split between studies on health and human biology ($n = 4$), socioeconomic outcomes ($n = 2$), and a blend of the two ($n = 3$).
- 4) With one exception, all studies relied on a non-experimental design. In a study in progress in Madagascar (C1), researchers are assessing the impact of coral reef rehabilitation on the health and nutrition of fishers and smallholders across 14 communities varying in proximity to coral reefs.
- 5) Other than one panel (A2), researchers followed people of all ages.
- 6) Data collection took place at irregular intervals (Column V). The exceptions were the continuous annual surveys among Dogon (2010–2019; A2), Betsimisaraka and Tsimihety (2004–2012; C1a), and Tsimane' (2002–2010; C2).
- 7) With only nine panels and missing information about the number of people, households, and communities in some of those panels, we cannot speak confidently about general sample sizes, but the figures indicate that researchers tried following a median of 832 people (minimum = 80; maximum = 10000) from a median of 345

household (minimum = 91; maximum = 483), and a median of four communities (minimum = 1; maximum = 14).

- 8) Sample attrition from the baseline surveys varied considerably, with a median of 16%, but a minimum and a maximum of 3% and 52%. In one study in progress (A3) that enrolled additional participants in subsequent survey waves after the baseline survey, attrition between surveys ranged from 16% to 35%.
- 9) Lastly, with two exceptions (A2 and C2), datasets have not been uploaded to public repositories (Column X).³

Smallholders (Table 2). Some of the findings about panels among smallholders resemble findings from panels in small-scale rural societies. Other than studies in Mali (B1) and The Gambia (A5), which measured children every five years (B1) or yearly (A5), the other studies took measures at irregular intervals. Except for the panel in The Gambia, studies date to the turn of the twenty-first century, with only one study continuing (A3). Except for (C1) researchers have not archived panels in public repositories, and only one panel was part of a natural experiment (A1). Yet some contrasts appear. Unlike panels in small-scale societies, almost all panels among smallholders dealt with human biology and health. One socioeconomic panel among smallholders stands out because it tracked the individual child, the kinship network, and the child's domestic unit over two decades in seven Malian communities (B1).

In summary: 1) Combined, the two tables show researchers had a greater penchant to use panels to examine human biology and health than socioeconomic outcomes, reminiscent of the first long panels in high-income countries. 2) Most research teams gathered data at irregular intervals and have not yet made the data available to the general public. 3) Policy concerns did not drive the impetus to gather panel data, but in two cases, researchers designed panels from the outset as part of natural experiments to evaluate the health impacts of proximity to a road (Table 2, A1) or coral reefs (Table 1, C1).

We have no sound explanation for the presumably limited demand for panel datasets implied by the numbers in Column X of tables 1–2. Although we cannot tell whether demand is limited or whether requests are frequent but undocumented, we can hypothesize why requests for panel datasets might be weaker than those for cross-sectional datasets. Compared with the number of researchers who conduct cross-sectional analyses of small-scale societies, there are fewer who do panel

³ All data archived in a public repository is available to the general public (sometimes with restrictions), but not all publicly available data is necessarily archived. We stress data in public repositories because such data had to comply with standards (e.g., ethics, data dictionary) before it could be archived and because the data is typically stored to facilitate use by third parties. The movement toward transparency, accountability, and replicability in science requires that data be publicly available, not necessarily that it be archived in a public repository.

analyses of the long-term life course in these societies. Fewer analysts mean there will be less demand and fewer requests for panel datasets.⁴

5. Aim 3: Case Study: How aspects of the life course over a long time vary between Tsimane', a small-scale society of Indigenous People in the Bolivian Amazon, and people in high-income countries.

In this section, we draw on the panel study we did among all Tsimane' (Table 1, C2; $n = 1453$ individuals; 240 households) in 13 villages in 2002, whom we followed every year until 2010 (Godoy, 2025). This allows us to estimate year-to-year changes in outcomes. We note Tsimane' have been extensively studied since 2002 in the on-going "Tsimane Health and Life History Project (THLHP)" (Table 1.1, A4) (Gurven et al., 2017). These two studies overlap slightly but differ in significant ways.⁵ We compare our data with long-term data gathered from people in high-income countries. The choice of topics for the comparisons is driven by findings from high-income countries. For instance, we compare intragenerational wealth mobility between Tsimane' and people in high-income countries because intragenerational economic mobility is a topic of paramount concern in high-income countries. On the other hand, we gathered panel data on catch-up growth among stunted children (Undurraga et al., 2018; Zhang et al., 2016) but we cannot compare those results with the growth velocity of stunted children in high-income countries because there is little growth stunting in high-income countries.

Before discussing comparisons, we note four caveats. 1) Like any cross-cultural comparison, comparison of intragenerational dynamics requires caution. Ideally, the years covered in the studies and the age of participants should be similar to rein in cohort effects. 2) Scales matter as well. Intragenerational mobility, like moving from "rags to riches", in a large industrial society such as the USA is a very different journey than moving from the bottom to the top of the economic ladder in a small-scale society; in the first case, the individual often has to overcome ethnic and racial discrimination, whereas in the second the individual has to overcome hurdles associated with the social connections of small village life, such as jealousy, envy, and witchcraft accusations. 3) Data structures differ as well: in high-income countries, income and wealth mobility often derive from nationally representative samples and administrative tax records, whereas in small-scale societies, it typically relies on survey self-reports of resources, increasing measurement error and reducing sample size. 4) Results of comparisons have to be interpreted with caution because the same outcome (e.g., wealth) will be defined and measured in different ways across study settings. Which raises the question: If every context is so particular and if so many caveats apply, why compare? The comparisons we present are exploratory, designed to illustrate (not prove) the gains from a cross-cultural approach to life course dynamics, and to encourage better cross-cultural comparisons in the future.

⁴ The explanation echoes an explanation offered half a century earlier about the limited use and value of panels. Writing about panel studies in the behavioral sciences during the first half of the twentieth century, Glock (1967, pp. 56–57) attributed their scarcity "to the fact that the logic of panel analysis" had not been fully grasped by researchers and others went as far as to say that a panel study should be a research design of last resort (Hill, 1964, p. 196).

⁵ THLHP focuses on health over socioeconomic outcomes while TAPS does the opposite. THLHP combines cross-sectional and panel elements; TAPS is foremost a panel. Both studies are interested in trends over time, but differ in their approach. THLHP estimates life-cycle trends based on age; TAPS estimates time trends through the actual year-to-year passage of time from 2002 until 2010, inclusive. A thorough discussion of how the two studies differ is beyond the scope of this article.

5.1. Similarities

Nutrition transition and body weight. In high- and middle-income countries and in rural societies of the Global South with greater exposure to the marketplace, households have shifted toward eating more processed foods rather than producing their own. The "nutrition transition" has been associated with a range of adverse health outcomes, such as weight gain (Popkin & Ng, 2022). Among Tsimane', Bethancourt et al. (2019) also found that during 2002–2010 households consumed more foods from the marketplace, like cooking oil, refined white sugar, and pasta, which contributed to adult weight gain.

Intragenerational mobility: Patterns. 1) In both high-income countries and among Tsimane' there is a glass ceiling for those at the very bottom and a glass floor for those at the very top of the distribution of income or wealth. One could find 49%–52% of Tsimane' adults who were in the bottom quintile or top quintile at baseline (2002) in the same quintile by 2010 (Godoy et al., 2026). In the USA, from 1987 to 2007, about half of those in the bottom wealth quintile remained there, while about 60% of those in the top quintile also stayed there (Auten et al., 2013). The percentages in the two places are rather similar, hinting at considerable immobility at the extremes of the economic ladder in these two very different societies. 2) Within high-income countries (Fisher & Johnson, 2020) and within the sample of Tsimane' followed in the panel, intragenerational economic mobility correlated negatively with economic inequality within each of these two places (Godoy et al., 2026).

Intragenerational mobility and well-being. A recent meta-analysis of adult intragenerational mobility in high-income countries found that mobility in class, social status, or economic resources often produced unclear or null effects on many dimensions of adults' well-being (Shi & Gugushvili, 2025). Among Tsimane' adults, we estimated the association between changes in wealth quintile between 2002 and 2010 and 20 objective and subjective indicators of well-being, and also found mostly null and inconclusive results (Bauchet et al., 2026).

Sociality. In the USA, historic forms of sociality and trust have weakened (Mewes et al., 2021). Participation in clubs, religious institutions, and neighborhood associations has given way to more individualized forms of sociality. Among Tsimane', the two historic forms of sociality consisted of commensal drinking of a home-brewed beverage (*chicha*) and villagers stopping by for informal visits. The frequency of these two aspects of sociality decreased during the panel (Godoy, 2025; Rosinger & Bethancourt, 2019).

In short, dietary shifts toward processed foods, a parallel rise in body weight, immobility at the top or bottom of the economic ladder, and fraying social ties are not unique to high-income countries. They also happen among Tsimane', one of the most economically self-sufficient small-scale societies in the world at the time of our research (Henrich et al., 2010).

5.2. Differences

Economic inequalities. Economic inequalities have risen sharply in high-income countries during the twentieth century (DeLong, 2022; Piketty, 2014, 2022). World Bank data suggest that from 2002 until 2010, income inequality in the USA rose yearly by 0.008%.⁶ In contrast, among Tsimane', inequalities in 15 economic outcomes (e.g., farmland, asset wealth, diet, monetary income) grew by a yearly average and median of 0.15% and 0.4% during 2002–2010 (minimum = -2%/y; maximum 2.1%/y) (Godoy et al., 2024; Appendix F, last column). Thus, over the same time period, economic inequalities among Tsimane' (0.15–0.4%) grew faster annually than in the USA (0.008%).

Intragenerational mobility across all ranks. 1) Excluding people who did not move out of the very top or the very bottom of the income or

⁶ Source: <https://data.worldbank.org/indicator/SLPOV.GINI?location=US>. Downloaded February 23, 2026.

Table 2
Long panel studies of smallholders.

Study name and status	Country	Societies	Cohort age	Years & frequency (t)	Baseline sample	Attrition	Outcome	Time-varying covariates	Data for public use & (# of requests) X
I	II	III	IV	V	VI	VII	VIII	IX	X
[A] Human biology and health									
[A1] Environmental change and diarrheal disease: A natural experiment	Ecuador	Smallholders, town dwellers, & Chachi (an Indigenous People)	All	2003–13; 1 observation/village; 2/18/2004–7/4/07, weekly (~3; 176 weeks) ^a	4196i, 21c	23% ^c	Diarrhea & three marker pathogens	Household network, exposure, hygiene, wealth, demographics ^a	Some ^b ; (2)
[A2] <i>Ribeirinhos</i> Longitudinal Study [A2a]	Brazilian Amazon	Mixed ethnicity river dwellers	0–77	2002 & 2009 (2)	469i	56%	Δ in HAZ, WHZ, BMIZ, ZTSF, ZUMA	Δ in cash income, schooling, farming,	NA; see notes (0)
[A3] Dominica Family Health Study*	Dominica	Smallholders	16–59 0–27	1997–2007 (mean = 7.5)	30i NA	33% NA	Δ in diet Height, weight, BMI	Manioc cultivation Age	NA; see notes
[A4] Spencer	Timor-Leste	Smallholders	0–19	2009–2016, every 6 or 12 months	1245i, 4c	NA	Height, weight, BMI	Time	NA
[A5] KWLPS	Gambia	Mandinka. Fula	All ages	1950–74; yearly	3c	27%	Mortality fertility growth	Birth interval	No
[B] Socioeconomics									
[B1] SLAM	Mali	Bwa	0–12	20y (1988, 1994, 1999, 2004, 2009)	7c	20%	Kinship ties; family structure	Time	NA
[C] Hybrid: socioeconomics, human biology, health, environment									
[C1] Mpimbwe Longitudinal Study	Tanzania	Mpimbwe	All Mpimbwe in 1 community	1994–2014 (10 surveys ~ 2y apart)	1c, 154 h, i: 464 < 18y 400 adults	Children 30%. Adults 36%	Anthropometrics, adult SES, stress, mortality	Family type, asset wealth, farming	GitHub (NA)

Notes: i = individuals, c = communities. Column I = * means that the study is in progress. In the notes below we include as an example one publication from the panel. Column X = number of requests by third parties unaffiliated with the study. NA = not available because we could not find the information in publications and researchers did not answer our requests to provide the missing data.

[A] Human biology and health.

[A1] Eisenberg et al. (2006) and Markovitz et al. (2012). a = Diarrhea data collected weekly, but covariates collected every 1–2 years. b = Data collection finished in 2013; as far as we know, the complete dataset is not yet available to the public. c = Because the study started with 21 villages, but 5 villages were dropped in 2009, we estimated the gross attrition rate at 23%. During 2004–2008 they conducted 11 surveys with a total of 4196 individuals. Of these, 13% were surveyed only once, 27% were surveyed 2–4 times, and 46% were surveyed seven or more times. Information for Chachi, a small-scale society of Indigenous People, was not analyzed separately owing to a small sample (James Trostle, personal communication).

[A2] Piperata et al. (2011). As far as we know, data is not available for public use.

[A2a] Piperata et al. (2011).

[A3] Keith et al. (2019). The authors do not report the initial sample size or the attrition rate but indicate that the total sample of 260 individuals was evenly split between females and males. The study came from one community. Data is not available due to privacy concerns.

[A4] Spencer et al. (2018). The panel does not have a name, so we named it “Spencer” after the first author. The survey was done among 1245 children in four communities of two areas: Ossu and Natarbora sub-districts. Sample size of children refers to the total sample, not to the baseline sample. They admitted new recruits into the sample after the start of the study. They report having measured children four times during the eight years and having a total of 4904 observations or measurements. They do not report the sample size of households.

[A5] Sear et al. (2002). KWLPS = Kiang West Longitudinal Population Study. Attrition refers to deaths and disappearance of children < 59 months as a share of the total sample (Sear et al., 2002, p. 48). No data on the total population of adults or the total number of households in the three villages at the start of the study. Data is not archived in a public repository and is not available to the general public.

[B] Socioeconomics

[B1] Dasr  et al. (2019). SLAM (*Suivi longitudinal au Mali*; Longitudinal Survey in Mali). Tracks individuals and domestic groups. Although the focus was on children, researchers linked children to adults and to others in the domestic group; in this way they tracked a child’s kinship network and domestic group over time. They do not report the sample size at baseline.

[C] Hybrid

[C1] Minocher et al. (2024) and Borgerhoff Mulder (2021). The study does not have a name, so we named it Mpimbwe Longitudinal Study. Baseline samples vary by publication but the figures shown in the table refer to Minocher et al. (2024). Attrition rates refer to losses between 1994 and 2010. We use the term SES (socio-economic status) to refer broadly to asset wealth, employment type, and farm output. Data available at <https://github.com/rianaminocher///pimbwe-child-outcomes> [github.com].

wealth distribution, there was much more mobility in the rest of the distribution among Tsimane' adults than among their peers in high-income countries. For instance, within-person quintile rank correlation coefficients between 2002 and 2010 for income (mean = 0.2) or asset wealth (mean = 0.35) among Tsimane' were much lower than in the USA (Godoy et al., 2026), where, depending on the duration of years in the panel and the age bracket analyzed, within-person quintile rank correlations ranged from 0.5 to often over 0.8 (Berman, 2022; Fisher & Johnson, 2020). 2) Unlike intragenerational mobility in high-income countries, which peaks during prime working age years (20 s and 30 s) (Shiro et al., 2022), intragenerational mobility among Tsimane' adults did not correlate with age, meaning that intragenerational mobility over the nine years of the study was as likely to happen among younger and older adults because, at least for retail earnings, opportunities were open for people of all ages (Godoy, 2025, p. 162). 3) In the USA, there was more income mobility than wealth mobility (Fisher & Johnson, 2020); among Tsimane' the opposite happened (Godoy et al., 2026).⁷

In short, the comparisons suggest that the age peak of mobility and economic immobility for most adults are not universal. They also suggest that small-scale societies might have a steeper growth in economic inequality than the USA.

5.3. Reappraising cross-sectional conclusions about small-scale societies with panel data

We made the point that the choice of outcome in the comparative study of life-course dynamics was driven by what high-income countries deemed important. Here, we address the question indirectly by leaving aside what matters to high-income countries and focusing instead on how a panel can challenge or confirm conclusions about life course dynamics in small-scale societies inferred from cross-sectional data.

5.4. Challenge

1) *Local ecological knowledge*. Researchers have lamented the loss of local ecological knowledge in small-scale societies because that knowledge presumably enhances environmental adaptation (Reyes-García et al., 2016), but the loss of knowledge has been hard to prove with cross-sectional data because assessing how individuals lose knowledge requires following the same individuals over time. In one cross-sectional study of local knowledge of wild plants among Tsimane' that controlled for age and for cohort effects (the latter via a set of binary variables for self-reported decade of birth), researchers found no effect of age on knowledge and no secular knowledge loss, meaning that the set of binary variables for decade-of-birth were not statistically significant (Godoy et al., 2009). However, in a later study, Reyes-García et al. (2013) replicated the analytical approach of the first study but, in addition, relied on two measurements of local knowledge of wild plants from the same 270 adults interviewed a decade apart (2000 and 2009). Like the first study, they found no secular loss of knowledge and no effect of aging on knowledge, most likely because adult Tsimane' do not know their age and guess when asked (Godoy, 2022; Chapter 5). Nevertheless, because they exploited repeated measurements from the same individuals, they were able to go beyond the standard approach and estimate changes in knowledge for the same individuals between 2000 and 2009 through direct measures of the passage of time, while controlling for cohort (decade of birth) and age, and found that knowledge declined by 12% between the two surveys. They did not test for interaction effects to assess if knowledge loss varied by decade of birth or age, but their approach represented an improvement over an

analysis limited to cross-sectional data.⁸ 2) *Autarky*. The expansion of the marketplace, along with other changes it brings, such as ecological degradation (Golden et al., 2021), is often thought to reduce the economic self-sufficiency or autarky of Indigenous People (Lu, 2007). Nevertheless, the nine years of panel data from Tsimane' that we gathered suggest that, depending on how one defines autarky, the likelihood that adults would eschew the marketplace increased (Godoy, 2025).

Confirm: General health and diet. Cross-sectional studies have documented a decline in health among Indigenous Peoples (Valeggia & Snodgrass, 2015). Our panel supports the conclusion. Self-perceived morbidities and men's tendency to smoke increased from 2002 until 2010. In addition, aspects of nutrition also worsened during the same period. Yields of two staples, maize and rice, shrank annually, while food consumption and diet quality declined as well. The per capita amount consumed of manioc, rice, plantain, game meat, and all macronutrients (except fats) fell (Godoy, 2025).

6. Aim 4: Major hurdles to the collection of long panel datasets in small-scale societies of the Global South

We build on our research experience and on the literature to identify major reasons for the dearth of long panels in small-scale societies of the Global South. The reasons are discussed separately, but they overlap and apply to other societies and places.

6.1. Financial and non-financial costs

A frequently mentioned reason for the dearth bears on the presumptive high financial costs of running a panel study compared with the costs of running a cross-sectional study (Crider et al., 1973, p. 7; Duncan et al., 1987; Singleton & Straits, 1999, p. 438). Indeed, panels have unique financial costs absent in cross-sectional studies, such as 1) retraining field staff, 2) maintaining infrastructure, ethical oversight, and community engagement, and 3) mitigating attrition. Furthermore, repeated interviews with the same person impact financial costs through respondent fatigue (Dan et al., 2025) and their requests for interventions to redress adverse outcomes monitored in the panel (e.g., illness). Respondent fatigue and/or rising living costs can also lead study participants to request more money or goods to conduct the same interview repeatedly. This happened in our panel; as the panel evolved, Tsimane' asked for (and received) higher compensation. Complying with requests for higher compensation or additional benefits increases a panel's operating costs and could dissuade researchers from returning. Besides financial costs, a long panel imposes a heavy personal, emotional, and social load on researchers leading the study.⁹ Furthermore, creating a user-friendly panel dataset requires a large amount of effort merging and appending datasets stored in different formats, defining and annotating variables, and updating documentation year after year.

Nevertheless, the debate about the financial costs of panels versus the financial costs of cross-sectional studies misses the point that panels based on direct observations have no substitute for accurately assessing changes over the life course of an individual. For this reason, the methodological debate has increasingly focused less on whether to invest in panel or cross-sectional studies, and more on how different

⁷ In studies of intragenerational economic mobility researchers typically distinguish flows (e.g., income, expenditures, consumption) from stocks (e.g., net wealth in land and durable assets); flows are measured over time intervals, stocks at a point in time (Borgerhoff Mulder, 2021).

⁸ Consistent with this variability, Golden & Comaroff (2015) use panel data from smallholders in Madagascar to show that modernization was associated with more observed wildlife consumption taboos and no generational decline in adherence.

⁹ An example comes from cultural anthropologist Evon Z. Vogt's long-term Harvard Chiapas project (1957–1980). Although not a panel, the project was longitudinally ethnographic, with a research and a training component (Vogt, 1994). Vogt devoted considerable personal effort to the endeavor, which meant that his own academic work often "took a backseat" (Kapsalakis, 2020).

modes of data collection — mail, in-person, web-based, or telephone — affect the financial cost and quality of a panel study (McGonagle & Sastry, 2023; Sastry & McGonagle, 2022). The debate also misses the point that panels lower the costs of doing a cross-sectional study if information for the cross-sectional study is already part of the panel. Indeed, some of the long-term studies in Tables 1–2 (e.g., Table 1, A4, C2; Table 2, C1) have produced numerous cross-sectional studies which would have been more expensive to do as stand-alone studies.

6.2. Funding schemes

The short duration and irregularity of research grants discourage investments in long panels in the Global South (Quiroga-Garza et al., 2022) and in the Global North (Alberts et al., 2014, p. 5774; Billingsley & Mahoney, 2021, pp. 123–124; Laudel, 2006, pp. 490, 500). In addition, the increasing competitiveness of research funding makes it difficult to obtain repeated funding over a decade (or more) to sustain a long panel. In the USA, grants from the National Science Foundation and the National Institute of Health, the two largest sources of public research funds most likely to pay for panel studies in small-scale societies and among smallholders, last at most 3–5 years, and require merit-based justification for renewal.¹⁰ At the National Science Foundation, applicants from large institutions conducting panel studies with nationally representative samples in the USA are more likely to secure continuous funding than researchers working in small teams proposing overseas research (Solovey, 2020, pp. 265–267). In the Global South, funding for research is also limited (Chankseliani, 2023; Quiroga-Garza et al., 2022). Other than the China Family Panel Studies, all the other large-scale long panels in the Global South noted in the section titled *Boundaries* have been financed by international organizations or by countries from the Global North.

6.3. System of incentives in academia

Even if early-career researchers wanted to gather panel data and had the technical expertise and resources to do so, they might find the rewards too uncertain and too far in the future to justify the investment. Establishing research partnerships, trust, and community participation for a panel takes longer than for “parachute research”. Institutions want early-career faculty to demonstrate they can publish; early-career faculty respond by collecting and analyzing field data promptly. Thus, institutional and personal incentives join to undermine investments in long panels.

6.4. Academic training

The discipline with the oldest tradition of studying contemporary small-scale rural societies is cultural anthropology, yet few of the panels in tables 1–2 were led by cultural anthropologists. This stems partly from weak graduate training in quantitative reasoning (D’Andrade, 2000; Negrón et al., 2024, p. 463). Biological anthropologists, near neighbors of cultural anthropologists, epidemiologists, and natural scientists interested in small-scale societies, approach research with backgrounds in mathematics and the hard sciences, some having completed the requirements for medical school. Many obtained an additional graduate degree in public health or did post-doctoral work in epidemiology. As part of that training, they get exposed to formal methods for estimating causal effects, including natural experiments and randomized control trials. This training allows them to appreciate the

value of panels and segue into them. But most other cultural anthropologists do not have the training or affinity for conducting a long-term quantitative panel study, though there is a tradition of doing qualitative longitudinal studies (Foster et al., 1979; Howell & Talle, 2012; Kemper & Royce, 2002).

7. Aim 5: Steps to overcome the hurdles

7.1. Costs: financial and non-financial

The short duration of research grants has three implications for researchers wishing to build a long panel in a small-scale society.

- 1) Start small by taking small steps. To make panels more feasible to launch, scale up, and make them more acceptable to funders, consider proposing an initial study of 2–3 years with the possibility of renewals. In this way, a long panel could arise from sequential stand-alone studies from the same sample. Each new grant might require a different justification, which should be easy to do because socioeconomic conditions change in the field site, and with those changes come natural ways of modifying a panel to make it relevant to new concerns in society or to new academic orientations (Johansen & White, 2002, p. 96; Lamphere, 2020; Moffitt et al., 2015). As the scope of the panel changes, keep a core set of variables necessary to analyze life-course patterns that motivated the original panel, but add or drop ancillary variables. Besides publications, requests for renewal of funding will be strengthened by archiving data in public repositories soon after processing the data. Major funding agencies in the USA and Europe, as well as journals, already require public archiving of data. Placing data in open-access archives increases discoverability and citations (Christensen et al., 2019).
- 2) If researchers want to use a panel to estimate life-course patterns from a previously studied population, but are limited to doing a cross-sectional study, consider building upon what came before by using a past cross-sectional dataset or the last survey wave of a finished panel as a baseline for a revisit. Under special conditions, revisiting participants from a previous quantitative study after a long absence allows for constructing a panel without continuous yearly investments or a permanent presence in the field. Examples of this approach in small-scale societies and rural populations in the Global South can be found in Tanzania (Brockington & NOE, 2021), Ecuador (Gray & Bilsborrow, 2020), Peru (Izquierdo, 2008), and elsewhere (reviewed in Godoy, 2025, pp. 52–53). The strategy works only if earlier researchers documented their data-gathering methods, provided the names of study participants to later researchers (if approved by the ethics board of the researcher’s institution and by study participants), and made the raw and processed data available to later researchers. The gap in years between the older study and a revisit prevents analysis of year-to-year changes, but allows researchers the ability to estimate the total amount of change of an outcome for the same person between the two periods quantitatively while eliminating biases from respondent fatigue. A downside is sample attrition and the various approvals necessary before making the names of study participants available to later researchers.
- 3) Taking advantage of digital technologies. The use of wearables to monitor biological outcomes in real time and to obtain data in non-invasive ways could lower costs, particularly appropriate with cut-backs in research funding (Swahn et al., 2024). Thus far, wearables have been used in public health and biological anthropology (e.g., Sarma et al., 2020) but some wearables, like silicone wrist bands or cameras, could be extended to other domains, like exposure to the marketplace, lifestyle transitions, diet, food or water security, and issues of climate change and extreme weather events (Alulu et al., 2024). Depending on the spread of telecommunications in the rural Global South, future panel studies might even be able to lower costs by relying on cell telephones or online devices. Among the Tsimane’,

¹⁰ Even the Department of Energy and the National Oceanic and Atmospheric Administration in the USA limits their grants to a maximum of five years, with renewals possible if re-applications are successful. A new initiative in the European Union offers “super grants” for a maximum of seven years to attract researchers from the USA (Naujokaitytė, 2025).

only 3% of adults owned a cell telephone in 2010, the last year of the panel; our ongoing research in a different set of more remote communities suggests that the share owning a cell telephone has skyrocketed to 37%. One last possibility is the ability to link panel data with administrative data, like tax, health, and demographic records (Fussell et al., 2025). Each of these possibilities carries risks and challenges. The use of wearables (Bulungu et al., 2023; Dobson et al., 2023) and administrative data (Jäckle et al., 2024) raises privacy concerns. The spread of cell telephone use might be more marked among some sub-groups (e.g., men), potentially producing a biased sample.

- 4) A useful model to lower panel costs comes from conservation projects in the rural Global South. In those projects, researchers are including and training professional and non-professional Indigenous People to gather and monitor data (Golden et al., 2017; Sigouin et al., 2025). Besides making the research endeavor more inclusive and horizontal, and training local people in their understanding of change, this practice in a panel study would lower the costs of obtaining information from attriters, the “Achilles heel” of panel studies (Thomas et al., 2012) because trained researchers in the community could interview attriters once they returned to the community or follow them to their new location.

7.2. Reconciling short- and long-run incentives in academia

The immediate academic goals of early-career faculty need not clash with the long-run goals of a panel. Panels can be designed with components best suited for cross-sectional analyses and for answering questions about life-course dynamics. A panel in progress can support publications in the short run by using cross-sectional data from early surveys, such as on water or food insecurity (Rosinger et al., 2024) or child growth stunting (Undurraga et al., 2018); these types of cross-sectional studies can also help understand and respond to pressing local challenges. As the panel unfolds, researchers can use later survey waves to assess the speed of recovery from adversity and long-term life-cycle trends. The challenge is maintaining focus on core variables tracked over time, even when the panel is used for cross-sectional purposes.

7.3. Academic training: adapting to a changing research landscape in the Global South

We noted earlier that one reason for the dearth of panel studies in cultural anthropology had to do with insufficient training in quantitative methods. One way to address the hurdle is for cultural anthropologists interested in a quantitative long-term study to collaborate with people who bring quantitative skills (Clark et al., 1995; Johansen & White, 2002). But this raises broader questions about how to navigate research in the rapidly changing landscape of the Global South. These changes include the growing agency and leadership of communities and research participants, including Indigenous Peoples, the expansion of innovative technologies for collaborative data generation, and deep ecological and socioeconomic transformations that are reshaping local realities. This shifting landscape has important implications for the composition of research teams and for the ways long-term relationships with panel study participants are built and sustained.

Team composition. At a minimum, a panel study in a small-scale society requires a partnership among researchers familiar with the society, researchers from other disciplines, and community members. Familiarity with quantitative reasoning and with qualitative methods of data collection among all researchers enhances mutual understanding (Slade et al., 2023) and nourishes respect for each other's way of knowing.

Study participants. The growing worldwide movement to decolonize how Western science is conducted in the rural Global South and among minorities in the Global North holds that study participants should endorse research that collects data from them, with benefits to the

community itself. Their epistemologies should be respected, and their say on topics, methods, and data ownership, use, and storage should be folded into the panel design from the outset (Woodbury et al., 2025). Involving members of local communities can improve retention, lower monitoring costs, and provide continuity, but requires sustained training, a local institutional base and infrastructure, and clear data governance. Large national models (e.g., Australia, Dodson et al., 2012) are instructive, yet adaptation to small-team contexts in the Global South may not be directly scalable and demand context-specific arrangements that are not obvious.

8. Conclusions

In sum, long panel studies in small-scale rural societies of the Global South offer a rare and powerful lens through which to examine life-course dynamics in contexts that are often overlooked by mainstream science. Comparing life-course findings across sharply diverse societies allows researchers to challenge or confirm the universality of findings and assumptions from high-income countries, reveal patterns of resilience and vulnerability, and deepen our understanding of human development in ecological and sociocultural environments that differ markedly from high-income countries. We have outlined some of the main scientific, logistical, financial, and institutional challenges of launching and sustaining panel studies in small-scale rural societies, and proposed strategies to address them, including incremental design, technological innovation, and community and interdisciplinary collaboration. The value of panels can go well beyond academic outputs: they can help inform policy, support local decision-making, and contribute to more context-sensitive knowledge production. Because repeated, unit-specific measures enable temporal ordering, identification of within-person change, and a stronger design to infer cause-and-effect relationships, their value should be encouraged by both academics and funders. Investing in long-term panels in the Global South can be more than a methodological choice; it is a commitment to understanding human lives in their full complexity, across time, place, and circumstances.

CRedit authorship contribution statement

Jonathan Bauchet: Writing – review & editing, Formal analysis, Conceptualization. **Ricardo Godoy:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **William R. Leonard:** Writing – review & editing, Methodology. **Victoria Reyes-García:** Writing – review & editing, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Asher Y. Rosinger:** Writing – review & editing, Methodology, Investigation, Funding acquisition, Conceptualization. **Susan Tanner:** Writing – review & editing, Methodology. **Eduardo A. Undurraga:** Writing – review & editing, Methodology, Investigation, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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