



Vulnerability Assessment Methodologies: A Review of the Literature

Second Edition





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ASPIRES

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ACRONYMS LIST

AIM	Amanah Ikhtiar Malaysia
ASPIRES	Accelerating Strategies for Practical Innovation and Research in Economic Strengthening
CARE	CARE International
ES	Economic strengthening
FCS	Food Consumption Scores
HCES	Household Consumption and Expenditure Surveys
HEA	Household Economy Approach
HES	Household economic strengthening
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HLSA	Household Livelihood Security Analysis
IGA	Income generating activity
M&E	Monitoring and evaluation
MFI	Microfinance institutions
NGO	Non-governmental organization
OVC	Orphans and vulnerable children
PAT	Poverty Assessment Tools
PEPFAR	President's Emergency Plan for AIDS Relief
PMT	Proxy means testing
PPI	Progress out of Poverty Index
SCORE	Sustainable, Comprehensive Responses for Vulnerable Children and their Families
SL	Sustainable Livelihoods
USAID	United States Agency for International Development
VAM	Vulnerability Assessment and Monitoring
VAT	Vulnerability Assessment Tool
VEP	Vulnerability as Expected Poverty
VEU	Vulnerability as Expected Utility

INTRODUCTION

The President's Emergency Plan for AIDS Relief (PEPFAR), a multibillion dollar US Government initiative dedicated to fighting the AIDS epidemic, has been credited for averting millions of HIV infections in Sub-Saharan Africa since its inception in 2003 (Bendavid & Bhattacharya, 2009). With the rollout of the third phase of the program, PEPFAR is emphasizing clear program targeting and raising demand for effective methods of assessing the vulnerability of target populations (President's Emergency Program For AIDS Relief, 2015). Acknowledging the complex inter-relation of economic status and the effects of HIV, PEPFAR's programming for Orphans and Vulnerable Children (OVC) emphasizes multisectoral intervention, including household-level economic programs designed to enhance resilience to both the effects of HIV and susceptibility to the disease. Among USAID-funded programs, these interventions are collectively known as Household Economic Strengthening, or just economic strengthening (ES). Though the language of ES is linked to PEPFAR, ES includes any microeconomic interventions used to economically stabilize vulnerable households to reach a specific set of desired wellbeing outcomes. In the case of PEPFAR, these outcomes are concerned with resilience to the effects of HIV.

Despite the demand for vulnerability assessment for targeting purposes, there remains no standard definition or method of measuring vulnerability for ES interventions in USAID/PEPFAR guidance materials. The purpose of this literature review is to propose a set of guidelines for defining and measuring vulnerability for targeting and program design in ES. These proposed guidelines are based on an overview of the published and grey literature on vulnerability assessment methods related to ES.

The review begins by describing how vulnerability is defined and measured across the hazards, sociology/anthropology, and economics literature. This is followed by a review of the research methods used in the published literature identified through a database search of studies on socioeconomic vulnerability at the household level. The review concludes with a proposed definition of vulnerability for ES and a model for future assessments.

METHODS

Given the diversity of literature about vulnerability, this review is limited to vulnerability assessment methods relevant to ES. Economic strengthening has been defined in the USAID/PEPFAR literature as a “portfolio of strategies and interventions that reduce the economic vulnerability of target households” (Wolfe, 2009a, p. 37). Therefore, this review only examines methods useful for determining economic vulnerability at the household level.

A manual search of gray and published literature was conducted to identify background information on vulnerability assessments, including theoretical frameworks used across disciplines related to ES and practical guidance on how to conduct a vulnerability assessment published by development agencies. In response to the growing emphasis on the concept of resilience among the development community, recent literature reviews on resilience were also consulted. Finally, the literature on proxy-means testing for poverty targeting was consulted to provide additional insight on vulnerability assessment methods for targeting purposes. Google Scholar and internet searches were conducted to identify key frameworks and their links to the published literature.

A more systematic search of published vulnerability studies was conducted using EBSCO, PubMed, Web of Science, and Scopus databases. Search terms included “Livelihood assessment,’ “Resilience assessment,’ “Vulnerability assessment,’ “Poverty assessment” AND (assess* OR analy* OR index* OR tool* OR Survey* OR Study* OR measur* OR eval*) AND (poverty OR livelihood* OR economic OR household* OR resilien*). These were further refined to include: (vulnerability AND livelihoods OR poverty OR economic AND assessment OR study OR index OR scale OR analysis).

Only studies meeting the following criteria were considered for inclusion:

- Published between 1990 and 2015
- Published in English
- Included reference to household-level assessments
- Included studies related to developing countries
- Included methodological description
- Included focus on livelihoods/social vulnerability

Studies were excluded based on the following criteria:

- Focused on medical or technical definitions of vulnerability
- Focused on disasters and hazards, unless livelihoods also mentioned
- Included study focused on developed countries
- Focus on food security only

- Situational analyses
- Not applicable to household level

Based on these criteria, 24 published studies were identified for analysis.

DEFINITION OF VULNERABILITY IN LITERATURE RELATED TO ES

The goal of assessing vulnerability for ES projects is to identify sources of economic vulnerability as relevant to desired project outcomes and to target households that can benefit from ES interventions. Given the diversity of definitions applied to the concept of vulnerability, it is useful to trace its epistemological origins to identify approaches of greatest relevance to ES. Alwang, Siegel and Jørgensen (2001) identify the following strands of literature on the topic: disaster management; environmental; economics, including poverty dynamics, asset-based approaches, sustainable livelihoods, and food security; anthropology/sociology; and health/nutrition. The theoretical frameworks most relevant to economic strengthening interventions originate in the economics and anthropology/sociology literature. This review also discusses disaster management literature, which in conjunction with Sustainable Livelihoods frameworks, has had a strong influence on the discourse on vulnerability used by development and relief agencies. Although Alwang et al. (2001) draws a distinction between the environmental and disaster management literatures, both feature similar concepts of vulnerability, and they are considered part of the “hazards” literature in this analysis. This review excludes any environmental literature and disaster management literature without strong socioeconomic analysis. The literature on health and nutrition is also excluded due to a lack of household-level economic analysis.

Across disciplines, vulnerability can be generally understood as the risk of falling below an accepted benchmark of welfare. The effects of risks depend on the level of exposure to a given risk and the ability to manage risk and cope with its consequences. A simplified formula of vulnerability can therefore be expressed as:

$$\text{Risk} + \text{Response} = \text{Vulnerability}$$

Disaster Management and Hazards

Alwang et al. (2001) identify a larger body of disaster management and environmental literatures related to vulnerability, but the sub-strand which corresponds best to the inclusion criteria for this review combines environmental and livelihoods approaches (p. 21). The hazards literature laid the foundation for the contemporary conceptualization of vulnerability in international development (Prowse, 2003). The most frequently used variation on the vulnerability equation used in this discipline is:

Sensitivity + Exposure + Adaptive Capacity = Vulnerability (IPCC, 2007 as cited in Antwi-Agyei, Dougill, Fraser, & Stringer, 2013, p. 905).

Adger summarizes: “Exposure is the nature and degree to which a system experiences environmental or socio-political stress.... Sensitivity is the degree to which a system is modified or affected by perturbations. Adaptive capacity is the ability of a system to evolve in order to accommodate environmental hazards or policy change and to expand the range of variability with which it can cope” (2006, p. 270).

Early hazards scholarship was based on the behavioral paradigm, which considered vulnerability to natural disasters a function of poor decision-making and limited information by those affected (Prowse, 2003). This paradigm was disrupted by a structuralist approach in the 1970s and 1980s, which proposed that hazards only cause disasters due to the underlying, structural factors causing vulnerability. Though acknowledging institutional structures at work, economic factors were typically not emphasized (Adger, 2006). However, subdisciplines such as human ecology and socio-ecology emerged to take a greater interest in socioeconomic factors of vulnerability. This resulted in a proliferation of integrated theories incorporating economic approaches such as Sustainable Livelihoods and entitlements approaches (Sen, 1981 as cited in Adger, 2006). Much of the hazards literature in this review is concerned with assessing socioeconomic vulnerability to climate change.

Sociology/Anthropology

Anthropology and sociology have been central to advancing understanding of the social and structural components of vulnerability as a concept beyond money-metric conceptions of poverty, as well as contributing to the cadre of research methods commonly used by development organizations. The anthropology and sociology literature on vulnerability distinguishes between social vulnerability and economic vulnerability and can be credited for expanding the concept of “assets” from the financial to the social (Alwang et al., 2001). The concept of social vulnerability has been incorporated into both the hazards and economic literature, and it is particularly relevant to the PEPFAR context, where HIV risk is linked to social vulnerability (Gupta, Parkhurst, Ogden, Aggleton & Mahal, 2008).

Literature from this perspective focuses on the multidimensionality of poverty and encourages the use of participatory methods to understand the qualitative features of poverty. It expands upon traditional poverty metrics, such as measuring one-dimensional proxies like consumption, to capture greater nuance, including attention to power dynamics. This literature analyzes the roles of social institutions and power in creating “external” risk. It also examines the ability to cope, or resilience, as connected to assets such as social capital as a function of “internal” risk. Alwang et al. (2001) trace the origins of this asset-based perspective most strongly with the economics literature on vulnerability.

Economics

Alwang et al. (2001) identify several strands within the economics literature on vulnerability: poverty dynamics, food security, asset-based approaches, and Sustainable Livelihoods. The analogue for the sensitivity concept in hazards approaches is risk in the form of economic shocks and stresses. The analogue for adaptive capacity is access to asset stocks and flows. Therefore:

Economic shocks/stresses + Exposure + Access to Assets = Vulnerability

Poverty Dynamics

The poverty dynamics literature is concerned primarily with the risk of falling into poverty or falling deeper into poverty. It has been noted that early distinctions between poverty and vulnerability, based on the assertion that the former is static and the latter is dynamic, are flawed because poverty can be measured dynamically (Alwang et al., 2001; Prowse, 2003). However, Prowse (2003) still recommends the use of vulnerability measures to capture variability at different levels of poverty, and that vulnerability and poverty measures are functionally distinct. Poverty can be defined in various ways, including multidimensional definitions, but this strand of the literature generally measures vulnerability using money metrics against a poverty benchmark (Alwang et al., 2001). Money is an attractive metric for economists because it is inherently quantitative and comparable across contexts. However, it has been noted that consumption is a limited indicator of wellbeing and fails to capture the complexity of poverty (Cohen, 2010). Approaches to capture other dimensions of poverty in this literature still tend to convert them to a monetary value, with questionable validity (Alwang et al., 2001).

The assumption driving ES interventions is that there is some sort of economic barrier preventing the households from reaching desired outcomes. This is similar to the concept of the poverty trap, which is a set of circumstances that prevent the accumulation of assets and therefore create chronic poverty (Carter & Barrett, 2006). The literature on poverty traps proposes that there is an asset threshold, known as the Micawber threshold, below which asset accumulation is limited. Although evidence for the existence of poverty traps is mixed (Kraay & McKenzie, 2014), the success of the graduation approach to poverty reduction after the BRAC model of combining asset support, training, and additional services in bringing so-called ultra poor beneficiaries to sustained, lower levels of poverty suggest that the combined support may have assisted in overcoming a poverty trap (Kraay & McKenzie, 2014; Banerjee et al., 2015).

Food Security

Food security has historically been measured as a proxy for poverty or to assess need for food aid in a given location, but, with influence from the Sustainable Livelihoods approach, its purview has expanded (Jaspars & Shoham, 2002). The FAO defines four dimensions of food security, including: physical availability of food; economic and physical access to food; food utilization; and the stability of these things over time (FAO, 2008). A number of rapid tools and indices have been developed to measure these dimensions of food security as a static state.

Like poverty indicators, they can provide insight into one dimension of vulnerability. Forward-looking assessments of vulnerability to food insecurity typically seek to uncover the underlying causes of vulnerability that result in food insecurity. In function, these assessments are similar to more general assessments of livelihood vulnerability (Jaspars & Shoham, 2002).

Sustainable Livelihoods

The movement toward integrated, dynamic measures reflects an overall shift in the literature favoring Sustainable Livelihoods (SL) approaches, which emphasize comprehensive analysis of the livelihoods of the poor as a starting point for intervention (Krantz, 2001). Here, livelihoods can be defined as “the capabilities, assets (stores, resources, claims and access) and activities required for a means of living...” (Chambers & Conway, 1991, p. 6).

The Sustainable Livelihoods framework has become part of the dominant paradigm among development agencies and is the preferred approach according to PEPFAR guidelines for ES (PEPFAR, 2012; Wolfe, 2009). It originated with the Brundtland Commission on Environment and Development in 1987 (Krantz, 2001) to bridge sustainable environmental management approaches and poverty reduction (Valdés-Rodríguez & Pérez-Vázquez, 2011) and draws upon the scholarship of economist Amartya Sen, whose conception of “entitlements” laid the groundwork for asset-based analysis focused on livelihoods (Alwang et al., 2001). Assets, also described as forms of “capital,” are described as the resources composing a sustainable livelihood. According to the widely-used DFID framework, these assets include human, natural, financial, social and physical capital (Farrington, Carney, Ashley, & Turton, 1999).

Despite cross-disciplinary appeal, SL approaches are not without criticism. Overall, Alwang et al. (2001) consider the framework to be “conceptually strong but empirically weak” due to its ambiguity on the measurement of vulnerability and its lack of specification of a minimum standard of livelihood (p. 11). SL approaches have been generally accused of insufficiently addressing power relations, including political and economic processes and gender issues (Murray, 2001; Turrall, 2011). Furthermore, SL analysis requires high levels of labor and skill to collect large amounts of data.

VULNERABILITY IN ECONOMIC STRENGTHENING

The SL framework has been institutionalized as the predominant approach in economic strengthening interventions. It recognizes several interacting dimensions of livelihood security, including livelihood assets, the vulnerability context, livelihood strategies and transforming structures and processes on the meso and macro levels (Masanjala, 2007, p. 1034). Based on analysis of financial portfolio management by poor households, USAID/PEPFAR guidance documents (Wolfe, 2009b) provide additional insight into how the vulnerability formula is defined for ES.

Risks are conceived of as shocks or stresses in terms of how they interact with coping capacity

or resilience to affect economic outcomes and, in PEPFAR-funded interventions, more distal HIV-related outcomes (PEPFAR, 2012). Where shocks are defined as discrete negative events, such as a death of a breadwinner or a natural disaster, stresses pose ongoing threats to wellbeing. Risks can also be characterized as either idiosyncratic (individual) or covariate (systemic) (Harttgen & Günther, 2006). In accordance with a Sustainable Livelihoods approach (SLA), asset capitals contribute to a household's ability to both manage risk prior to experiencing a shock and cope with a shock once it happens. In this way, assets are viewed as a proxy for resilience to shocks, where "the more assets people have, the less vulnerable they are, and the greater the erosion of people's assets, the greater their insecurity" (Moser, 1998, p. 3).

Strategies for responding to risk can be classified according to the severity of risks that households face. One typology distinguishes between survival, coping, adaptive, and accumulative strategies (Masanjala, 2007). At the lowest levels of vulnerability, livelihood strategies include accumulative strategies used to increase and diversify assets and adaptive strategies used to diversify risks. These include ex ante risk management strategies such as income diversification, savings, and insurance, which are the most conservative response to a risky environment and the most demonstrative of resilience (Chen & Dunn, 1996).

At higher levels of vulnerability, strategies are reactive to livelihood threats: coping and survival strategies. Coping refers to "temporary adjustments in behaviors related to income generation, eating, and asset utilization in response to shocks or stresses. In the face of persistent shocks or stresses, coping may become "adaptation," (Woller, 2011, p. 14) which is a longer-term shift in behaviors. Coping strategies begin with lower-impact "consumption coping" responses and progress to "livelihood coping" responses as shocks increase in severity (Ferreira, 2009). Consumption coping strategies are typically reversible, such as reducing consumption, drawing down liquid assets, borrowing, and seeking alternative employment (Chen and Dunn, 1996). Livelihood coping, on the other hand, may create irreversible setbacks for a poor household. Strategies may include liquidating productive assets, breaking social obligations, withdrawing children from school to work, and more extreme responses that can result in destitution (Chen and Dunn, 1996).

This sequence of coping strategies was documented by Donahue, Kabbucho, and Osinde (2001) in their study of asset liquidation in poor households responding to HIV. Households start by liquidating savings, then protective assets – those which can be converted to cash without impeding on future income generation – and finally productive assets. The role of ES is to prevent the downward spiral into negative coping patterns and enhance household resilience to shocks and stresses.

VULNERABILITY MEASUREMENT APPROACHES IN LITERATURE RELATED TO ES

Vulnerability measurement is useful for both targeting and designing ES programs to meet participant needs. A few principles for measuring vulnerability emerge across the literature considered in this review. Vulnerability assessments should have a predictive function (Naudé, Santos-Paulino, & McGillivray, 2009a) that measures vulnerability against a socially acceptable benchmark. They should evaluate both idiosyncratic (individual) and covariate (systemic) risk in addition to how the system study copes with these risks (Naudé et al., 2009).

Hoddinott and Quisumbing (2003) pose five questions that a vulnerability assessment should answer:

- What is the extent of vulnerability?
- Who is vulnerable?
- What are the sources of vulnerability?
- How do households respond to shocks?
- What gaps exist between risks and risk management mechanisms? (p. 46)

Answering these questions requires multiple data collection methods and additional data, including the identification of structural features of vulnerability (Hoddinott and Quisumbing, 2003). They also may require panel data on responses to shocks as well as private and public responses to risk over time to predict future vulnerability dynamics.

Vulnerability assessment design depends on its intended use, whether to inform policy or NGO program strategy, to mobilize community action, or to target programming. Most of the vulnerability assessments found in the published and grey literature develop indices for policy or program strategy purposes.

Disaster Management/Hazards

Although most ES programming does not focus on environmental assessments, the hazards and disaster management literature is the source of many foundational concepts and much of the language used in the economics literature on vulnerability assessment, and it frequently incorporates SL approaches. In the published literature, 16 out of 24 studies reviewed incorporated the hazards literature. This literature tends to focus on the effects of specific hazards or coping responses to shocks, most often related to climate change (Vincent, 2007, cited in Antwi-Agyei, 2013, p. 905). For example, Etzold, Ahmed, Hassan, and Neelormi (2014) focus on migration as a coping response to hazards, whereas Gaiha and Imai (2004) examine the effects of drought, Rayhan (2010) the effects of flood, and van Vliet (2010) examines potential vulnerabilities associated with the introduction of a conservation initiative.

Assessments in this strand of literature combine socioeconomic and biophysical approaches to

vulnerability assessment, with socioeconomic factors used to explain adaptive capacity (Ghimire, Shivakoti, & Perret, 2010, p. 225). According to the socioeconomic assessment approach, “vulnerability ... is considered the interaction between hazard and social vulnerability” (Gebrehiwot & van der Veen, 2013, p. 610). On the other hand, biophysical approaches are focused on a population’s biological and physical susceptibility to a hazard.

Most of the studies reviewed focused on socioeconomic approaches to vulnerability (Antwi-Agyei, Fraser, Dougill, Stringer, & Simelton, 2012; Brouwer, Akter, Brander, & Haque, 2007; Fazey et al., 2010; Johnson & Hutton, 2014; Mallick, Rahaman, & Vogt, 2011; Mukwada, 2012; Rajesh, Jain, Sharma, & Bhahuguna, 2014; van Vliet, 2010). However, others used either retrospective data or incorporated quantitative indices to measure biophysical factors of vulnerability in a combined approach (Ghimire et al., 2010; Hizbaron, Baiquni, Sartohadi, & Rijanta, 2012; Mustafa, Ahmed, Saroch, & Bell, 2011; Olajide & Lawanson, 2014; Oluoko-Odingo, 2011; Rayhan, 2010; Reed et al., 2013; Turner et al., 2003). Most studies used quantitative methods to develop indices for vulnerability, drawing on several approaches to define socioeconomic variables. Some included the asset capitals in the SL framework (Antwi-Agyei et al., 2012; Mukwada, 2012; Olajide & Lawanson, 2014; Oluoko-Odingo, 2011; Reed et al., 2013), while others drew on different sources. Indicator selection was usually based on participatory methods and literature scans.

Many studies estimate current vulnerability using retrospective assessments of how populations were affected by previous hazards. Antwi-Agyei et al. (2013) used rapid rural appraisal and surveys to obtain data on the characteristics associated with those households and communities that are resilient and vulnerable to climate variability. They achieved this by examining outlier households in regions pre-defined as vulnerable or not vulnerable to climate change based on past data on the effects of rainfall on crop production to see what distinguished them from other households. Incorporating an SL approach, they found that households that were better connected and had more diversified livelihood options were the most resilient to climate shocks. Similarly, another study examined the aftermath of Hurricane Sidr in Indonesia to estimate future vulnerability (Mallick et al., 2011). Mukwada et al. (2012) examined how households coped with land resettlement to determine vulnerability to multiple stressors in Zimbabwe, and Olajide et al. (2014) and Rayhan (2010) examined how households coped with flooding.

Poverty Assessments

In the published literature reviewed, eight out of 24 articles featured poverty dynamics approaches to vulnerability assessment. Assessments of vulnerability to poverty are nearly always quantitative, although they can be informed by formative qualitative research. Since poverty is a present state and vulnerability measures are intended to predict a future state, static poverty measures cannot be used alone as measures of vulnerability to either future states of poverty or other outcomes. Assessments of vulnerability to poverty use various econometric methods to predict the likelihood that a household will fall into poverty.

Proxy Means Testing

Though money-metric poverty measurements capture only one dimension of vulnerability, poverty is discussed as a factor of vulnerability across literatures and it can be useful to measure in an assessment. Because income and consumption are difficult to quantify accurately in developing country contexts, poverty is often measured using proxy data. Proxy means testing (PMT) is a common method used by national governments for targeting social benefits to individual households. It uses household surveys to identify characteristics thought to predict welfare, based on a formula developed from national datasets (Stoeffler, 2014). PMT is designed to be a cheaper alternative to means testing, which involves directly assessing the income or assets of a household (Devereux et al., 2015). Though PMT was not used in the studies found in the database search, poverty scorecards are commonly discussed in the grey literature and are considered here.

Poverty Assessment Tools (PAT) and the Progress out of Poverty Index (PPI) are two simplified PMT tools designed to help microfinance institutions (MFIs) target poor or extremely poor clients. “To be useful in vulnerability assessment, the PPI and PAT should be used to complement other vulnerability measures. The developers of PAT have stated that it is not designed for poverty targeting (USAID, 2013), but the developer of PPI has suggested that PPI scorecards can be used for this purpose (The SEEP Network Social Performance Working Group, 2008). It is generally not recommended to use either tool for targeting, as the design of the tools is only statistically valid at a group level (Ford Foundation et al., 2010).

Econometric Methods

Two econometric measures are typically used to assess vulnerability to poverty: Vulnerability as Expected Poverty (VEP) and Vulnerability as Expected Utility (VEU). (Hoddinott & Quisumbing, 2003; Naudé, Santos-Paulino, & McGillivray, 2009b). VEP and VEU produce individual level measures which can be aggregated to the population level (Hoddinott & Quisumbing, 2003, p. 12). Although possible, it is not recommended to use VEP and VEU for the purposes of individual level targeting, as these measures are much less accurate than when used at the aggregate level (Bérgolo, Cruces, & Ham, 2012). Although panel data are recommended to generate the most accurate results using econometric methods, they are often difficult to acquire in developing countries (Jha & Dang, 2009). Four studies in the published literature reviewed used econometric methods.

The VEP metric estimates the likelihood that an individual will get poorer over a certain period based on what happened with a similar population in the past. Of the poverty dynamics studies in the published literature reviewed, this was the most common method used (Agbaje, Okunmadewa, Oni, & Omomona, 2014; Chiwaula, Witt, & Waibel, 2011; Suryahadi & Sumarto, 2003). It is calculated using indicators on household characteristics related to poverty, shocks, and risks (Chaudhuri, Jalan, & Suryahadi, 2002). It is easy to calculate and particularly useful when only cross-sectional, rather than panel data are available (Jha & Dang, 2009). Though results using this measure can be similar to ex post poverty measures, VEP has the power for a

finer level of discrimination than measures like PPI or PAT, and can be particularly useful in situations where a large portion of the population is just above the poverty line (Hoddinott & Quisumbing, 2003). Ultimately, Jha and Dang consider VEP a “second-best solution” (2009, p. 10) when panel data are unavailable. Panel data is rare and expensive, so using measures calibrated to panel data, but calculable with cross-sectional data, is more cost effective.

The VEU measure is based on a definition of vulnerability, “as the utility lost due to risk, as the difference between the expected household consumption and the certainty-equivalent consumption,” or consumption that would have occurred in a situation of certainty (Jha & Dang, 2009, p. 46). This measure has the benefit of disaggregating vulnerability due to poverty and vulnerability due to uninsured risk. Although considered a stronger measure of vulnerability than VEP, VEU is difficult to calculate and reliant upon difficult-to-acquire panel data. Only one study used this approach (Rayhan, 2010).

Hoddinott and Quisumbing (2003) point out that both measures can be used together, and that the definition of risk in terms of consumption or income can be replaced by health, education or other indicators of wellbeing. Additionally, there is no one method for using these measures, and the literature contains various approaches. Each measure has its relative advantages: VEU examines poverty and risk, whereas VEP provides less insight on risk and can actually lead to perverse policy outcomes that increase risk for households (Hoddinott & Quisumbing, 2003). This is because the calculation of risk-aversion for poor households does not match up well with empirical evidence, and VEP calculations may make it appear that increasing risk may decrease vulnerability in some situations. However, VEP can be measured using cross-sectional data, while VEU’s reliance on panel data limits its utility. Additionally, as quantitative methods, these approaches rely on a predetermined definition of vulnerability, which may or may not line up with perceptions of vulnerability at the community level. The richness of these measures can be enhanced when combined with qualitative methods.

Other Methods

Three studies in the poverty dynamics literature reviewed did not use econometric methods to assess vulnerability to poverty (Al-Mamun, Mazumder, & Malarvizhi, 2014; Bird & Shinyekwa, 2005). Al-Maman et al. (2014) compiled a set of indicators from the literature to assess the impact of Amanah Ikhtiar Malaysia’s (AIM) microcredit program on the level of economic vulnerability among poor household clients in Malaysia. Indicators selected included income variation, diversity of income sources, and assets available. The study used a conception of vulnerability focused on economic stability, examining levels of income and asset poverty over time. It did not attempt to identify structural drivers or other dimensions of poverty.

Bird and Shinyekwa (2005) use a variety of sociological/anthropological methods to examine drivers and interrupters of chronic poverty, using past data to predict the likelihood of downward mobility. The study conducted participatory wealth ranking exercises, a household survey, and life history interviews. Of the poverty dynamics studies analyzed, Bird and Shinyekwa (2005) were the only ones that did not generate a vulnerability index or quantitative vulnerability

estimates. Instead, the focus of the study was to break down specific factors associated with poverty trajectories over time. Although this approach demonstrates a great deal of nuance, its design demanded a heavy investment and did not yield clear results that policymakers usually seek. However, it does yield insight for indicators that may be useful for future vulnerability assessments.

The use of a simple, quantitative Vulnerability Assessment Tool (VAT) by the SCORE program is probably best representative of how vulnerability assessments are used in practice for PEPFAR-funded OVC projects (Lowicki-Zucca, Walugembe, Ogaba, & Langol, 2014). The tool, which Lowicki-Zucca and colleagues used to measure the effects of savings groups on participant vulnerability, includes several domains of child wellbeing, with an emphasis on household economic status. It combines a multidimensional concept of vulnerability from anthropology/sociology with a simplified household poverty assessment.

Food Security Assessments

Food security is closely linked with economic status, and is useful for informing ES activities. The World Food Program's Vulnerability Assessment and Monitoring (VAM) activities analyze vulnerability to food security at the macro and meso levels during crisis situations, to target food aid, and during non-crisis situations. These can provide valuable secondary data sources for vulnerability assessments for ES. For primary data collection, there are several tools used to measure food insecurity on the household level. Calorie intake has historically been regarded as the "gold standard" of food security measurement, but it is costly and time-intensive to collect these data (Maxwell, Coates, & Vaitla, 2013). Household Consumption and Expenditure Surveys (HCES) are another in-depth way to collect food security data. Examples of rapid field tools include: Food Consumption Scores (FCS), Household Food Insecurity Access Scale, Coping Strategy Index, Household Hunger Scale, and Household Dietary Diversity Score, among others (Jones, Ngure, Pelto, & Young, 2013). These scales are easily integrated into household surveys and can be useful as indicators of economic vulnerability generally.

In a review of the published literature, only one study in the food security strand of literature met our criteria for inclusion. Oluoko-Odingo (2011) examined vulnerability to food security based on climate-related shocks, integrating key indicators related to food insecurity, including attention to natural capital and structural factors related to food production.

Livelihood Assessments

A key part of SL approaches is the integration of livelihoods analysis into general economic and consumption assessment (Valdés-Rodríguez & Pérez-Vázquez, 2011). Livelihood assessment requires the comprehensive analysis of livelihoods practices, the institutional and historical context, and how livelihoods interact with asset capitals in that context (Scoones, 1998). Livelihood assessment is used by major development agencies and multilateral organizations to diagnose vulnerability, engage in project planning, and monitor change over time (Valdés-Rodríguez & Pérez-Vázquez, 2011).

Murray (2001) has identified several key principles guiding livelihood assessment. First, livelihood assessments should connect micro-level research, including data on individual and household situations, with macro-level data, including how larger institutional factors, such as the political, economic, and legal structures affect livelihoods. To illuminate these links, some approaches emphasize aggregating households according to shared livelihood criteria, such as wealth zones, agro-ecological zones, or political boundaries (Frankenberger, Mock, & Jere, 2005).

Much of the comprehensive guidance available on livelihood assessment is available in the grey literature disseminated by development agencies. Although SLAs have received less attention in recent years (Turrall, 2011), references to the DFID framework remain fixed in guidance by PEPFAR and other donors and agencies. Some comprehensive frameworks include the Household Economy Approach (HEA) developed by Save the Children UK and Household Livelihood Security Analysis (HLSA) developed by CARE.

There is a notable disconnect between the methods for broad scale analysis proposed in the grey literature and the analyses in the published literature, which tend to use more precise and discrete definitions of vulnerability in terms of specific shocks, such as climate change, rather than a comprehensive analysis of all potential shocks to all livelihood types in an area. In the published literature reviewed, six of 24 studies explicitly identified using a SL approach, often in combination with other frameworks. Most studies use SLA to examine the effects of specific kinds of shocks on asset capitals. Reed et al. (2013), Antwi-Agyei (2013) and Olajide and Lawanson (2014) combine SL and hazards approaches to analyze vulnerability to climate change, while Oluoko-Odingo (2011) also includes food security impacts into assessment.

Mills et al. (2011) look more specifically at the role of livelihoods themselves in contributing to wellbeing, using a multidimensional analysis to understand the relative vulnerabilities of people in fishing communities across dimensions similar to asset capitals. Mukwada (2012) examined the capabilities of land reform beneficiaries to cope with stresses and shocks, using sustainable livelihoods concepts to identify patterns in livelihood trajectories for different categories of beneficiaries.

DISCUSSION

Vulnerability assessment methods reviewed generally attempted to: 1) quantify relative vulnerability for different groups of people; 2) provide descriptions of vulnerability processes; 3) mobilize communities through participatory research and problem-solving; and/or 4) target households for intervention.

There are a number of challenges in quantifying and creating categories of socioeconomic vulnerability for program targeting. There is no standard definition or measurement for vulnerability, which tends to be conceptualized broadly by donors and development agencies.

Vulnerability indices are often based on subjectively selected indicators, with arbitrary cut-off points between categories. In the published literature reviewed, relatively little work was done using statistical methods (such as principle components or factor analysis) to assess how much the indices used were able to account for variance between vulnerability groups. A recent study in Côte d'Ivoire (Burke et al., 2016) suggests that an index approach based on a large dataset of SL-related indicators may only account for a small portion of what makes people vulnerable, and that there are, indeed, many complex pathways that result in vulnerability. Given the broadness of the concept of vulnerability common in donor scopes of work, targeting ES program participants based on vulnerability status as defined by an index may create dubious distinctions. Burke and colleagues (2016) illustrate how broad concepts of vulnerability imply a greater number of causal pathways than can be captured with a simple scale.

These findings suggest that broad definitions of vulnerability for heterogeneous groups require comprehensive qualitative approaches to understand the causes of vulnerability they face. OVC, one of PEPFAR's target populations, are one such heterogeneous group. PEPFAR defines OVC as "children who have lost a parent to HIV/AIDS, who are otherwise directly affected by the disease, or who live in areas of high HIV prevalence and may be vulnerable to the disease or its socioeconomic effects" (PEPFAR, 2012, p. 20). This definition effectively covers all poor children in areas of high HIV prevalence. People within this group may experience very different factors that contribute to or protect against different sets of socioeconomic risks, including disability, caste, race, urbanicity, or gender. Hence, comprehensive approaches to vulnerability assessment, such as SL approaches, are useful to identify numerous pathways of vulnerability. However, such approaches are expensive, and without careful design, may yield a large amount of data without illuminating causal pathways of vulnerability.

Alternatively, focusing on specific causal pathways that can be affected by an intervention, and narrowing the focus of vulnerability, can help generate more valid indices and simpler targeting tools. Finally, a case management approach, where individuals or households receive individualized support and are connected to services based on needs identified by a case manager, allows programs to match interventions to households according to their unique pathways of vulnerability.

Toward Defining and Measuring Vulnerability in Economic Strengthening

To enhance the design and targeting of interventions, we now propose a definition of vulnerability for use in ES interventions grounded in the concept of poverty traps and a conceptual model for future tool development.

A PROPOSED DEFINITION OF VULNERABILITY FOR ES

ES interventions seek to stabilize household economic status in service of a specific wellbeing outcome, usually related to HIV. This is accomplished by enhancing household resilience to

shocks and stresses to reduce the likelihood that households will be drawn into a downward spiral of deleterious coping strategies that detract from desired outcomes. In addition to protecting against destitution as a result of HIV-related shocks and stressors, ES aims to stabilize and enhance household capacity to sustain positive outcomes. For ES, the concept of “development resilience” is useful for defining intervention goals, and the concept of poverty traps is useful for identifying points of intervention and indicators for success.

Like vulnerability, resilience is a broad concept with an array of related conceptual frameworks used by development agencies that incorporate economic and hazards approaches (Frankenberger, Conostas, Neson, & Starr, 2014). For ES, one useful approach is Barret and Conostas’ concept of “development resilience” (2014). The authors note that common definitions of resilience as the capacity to re-stabilize after a shock may not be useful for defining development outcomes when stabilization merely means a return to chronic poverty. Instead, development resilience “is the capacity over time of a person, household or other aggregate unit to avoid poverty in the face of various stressors and in the wake of myriad shocks. If and only if that capacity is and remains high over time, then the unit is resilient” (p. 14626).

According to this definition, a household cannot be considered resilient until it has escaped a set of barriers preventing adequate asset accumulation to protect against shocks, also known as a poverty trap. Although ES interventions may not always bring households out of poverty, they should improve long-term household-level resilience to economic traps acting as a barrier to specific outcomes, such as HIV-related health outcomes. The objective of a vulnerability assessment, then, is to identify the thresholds at which a poverty trap occurs, or the point where a household no longer has sufficient assets to protect against deleterious coping strategies in the face of shocks. Vulnerability based on the poverty trap concept can be summarized as the susceptibility of a household to specific negative wellbeing outcomes as a result of deleterious coping strategies prompted by shocks and stresses, within a set of barriers to development resilience (poverty trap).

Identifying a threshold for development resilience may be useful for determining which households can be considered vulnerable. However, matching households to appropriate ES interventions requires additional understanding of household needs and coping strategies. The framework used by PEPFAR to describe categories of household economic status, also known as the economic strengthening pathway, distinguishes among households “in destitution,” those “struggling to make ends meet,” and those “prepared to grow” (PEPFAR, 2012). According to this approach, households in destitution are not engaged consistently in economic activity and require social transfers for survival, so ES interventions aimed at asset accumulation are not an appropriate entry point for this group. Households struggling to make ends meet are poor but volatile, requiring interventions to protect their assets from erosion due to shocks and stresses. Those households prepared to grow may still be poor, but their consumption is stable. Interventions aimed at asset growth are most appropriate for this group. Because of the challenges in developing and measuring valid categories of vulnerability, it is likely that the best approach to matching appropriate interventions to households will rely on qualitative methods to

understand household strengths, goals, and perception of their own capacity to take on risk.

Although the above definition for vulnerability in ES is focused on economic vulnerability, it should be emphasized that it is related to specific wellbeing outcomes – in the case of PEPFAR, those related to HIV. Furthermore, ES interventions are generally not implemented in isolation, but rather used to complement other interventions focused on the desired outcomes. Therefore, in addition to identifying the thresholds of barriers to asset accumulation, vulnerability analysis can be used to gather information on other factors contributing to negative outcomes.

A PROPOSED APPROACH FOR VULNERABILITY ASSESSMENT IN ES

Is every household eligible for PEPFAR services stuck in a poverty trap from which they can be liberated once they have reached a particular asset threshold? Certainly, not. However, the concept does provide a useful heuristic for identifying empirical cut-off points between vulnerable and non-vulnerable that are germane to ES intervention design and goal-setting. Below, we propose two approaches to identify these categories. These approaches should be accompanied by additional data collection methods to identify broader causal pathways of vulnerability prior to project design, both to inform intervention strategies as well as targeting criteria.

Collecting data on how households use savings can provide an approach to developing a simple vulnerability assessment tool for ES. The accumulation of protective and productive assets is a key feature in preventing a downward spiral into deleterious coping mechanisms in the face of a shock. This accumulation can only happen when savings are invested in these assets, so insights into potential poverty traps should emerge around savings patterns. During a formative research phase, qualitative data should be collected to identify the key productive assets in each context, which will depend on the livelihood strategies of a given group, and establish the barriers to saving and investing in these assets. Further investigation, which could include data obtained from participatory exercises or panel data on assets from questionnaires, could help identify the thresholds for these assets required for resilience to outcomes of interest. This information can be used to inform monitoring and evaluation (M&E) goals for asset accumulation, as well as a quantitative asset index tool to measure progress.

Asset-based approaches to identifying poverty thresholds often use asset indices to reduce a large number of assets down to a more manageable set of asset types (Barrett & Carter, 2013). There are some limitations to this approach. First, assets are slow to change, making it difficult to detect changes over short periods of time. Additionally, asset indices are very sensitive to how they are constructed, which can depend on essentially “arbitrary decisions” (p. 985). One alternative to an asset index is to use qualitative methods to explore a population’s behavioral responses to a poverty trap or other economic threshold of interest. This formative research could be used to develop a tool that focuses on risk management and coping mechanisms

identified as relevant to different levels of vulnerability. As pointed out by Barrett and Carter (2013), this is not a well-studied approach but has potential to enhance the efficiency of vulnerability assessment.

In addition to identifying who is vulnerable and to what extent, a vulnerability assessment should identify the sources of vulnerability, how households respond to shocks, and where gaps exist between risks and risk management mechanisms (Hoddinott and Quisumbing, 2003). The literature reviewed demonstrates several approaches that can be incorporated into ES interventions. Estimates of the impact of covariate shocks found in the hazards literature, and assessments of vulnerability to poverty based on past data can both be instructive to program designers and implementers to quantify relative vulnerability of households. Qualitative approaches, such as those used by Bird and Shinyekwa (2005), explore the dynamics of vulnerability that can be used to identify points of intervention. A vulnerability assessment for ES interventions will likely require multiple data collection methods to meet specific programmatic needs.

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Mission Statement

ASPIRES accelerates evidence-based practice in economic strengthening for vulnerable populations through research and technical assistance.

Statement of Purpose

ASPIRES is a PEPFAR- and USAID-funded economic strengthening (ES) project focused on vulnerable populations, especially those affected by HIV. We aim to promote evidence-based practice by providing technical assistance (TA) for integrated ES programming most consistent with positive livelihood, health, and well-being outcomes. At the same time, we strengthen the evidentiary record through rigorous research so that future programming efforts have stronger foundations.

Research is at the heart of the ASPIRES identity, and all of our projects begin with a systematic interrogation of the existing evidence base in relevant program areas. We make major investments in original evaluation research of the highest possible rigor, both for course correction in implementation and to add to the evidence base. We share our findings on best practices with partners, the broader development community, policymakers, and other key constituents, and we offer TA to support programs that seek to replicate those practices.

ASPIRES provides limited direct implementation. Instead, we focus on providing existing USAID-funded projects with TA and research related to ES. This allows us to balance the collaboration necessary for in-depth research with independence from program operations. In this manner, we generate findings that contribute to identifying a core set of pathways to greater resilience for vulnerable households, and that provide insight into effective, efficient, and scalable interventions to achieve the desired impacts.

ASPIRES has no single theory of change; we are not a single-model or one-size-fits-all project. We are open to all manner of integrated ES interventions of interest to our USAID and PEPFAR stakeholders, with the ultimate aim to shape interventions around the best evidence available.

