



Chapter Title: Associations Between Neighborhood Social and Economic Characteristics and Resident Health and Well-Being

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Book Author(s): Sarah O. Meadows, Laura L. Miller and Jeremy N. V. Miles

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Chapter One. Associations Between Neighborhood Social and Economic Characteristics and Resident Health and Well-Being

Airmen and their families live under many stresses—frequent moves, deployments, reintegration following deployments—and rely on the Air Force for resources to help safeguard the health and well-being of themselves and their families. Many of these resources are utilized at the base level. That is, each Air Force base (AFB) has a set of offices, programs, and individuals whose responsibilities include providing information, education, health care, recreational programs and facilities, and other programs and services to enhance the quality of life (QOL) and organizational commitment of Airmen and their families. But Airmen and their families may also rely on resources available in the communities surrounding the installation to which they are assigned or, if they commute to the base, in the neighborhoods and base areas where they live.

Active-duty Airmen and their families are typically reassigned to a different base every few years. With each move, military families must find new housing, new schools, new places to exercise or socialize, and, for many spouses, a new job. Families may need to adapt to new climates, security environments, regional cultures and customs, neighbors, co-workers and supervisors, and more. Just as not all bases are the same, not all families who are assigned to those bases are the same. The area surrounding a base and, more importantly, the resources it provides also vary. The relative quality of bases and their surrounding areas can have an important influence on Airmen's and families' social support networks, job and life satisfaction, and overall health and well-being. Reserve Airmen are not required to move from base to base and thus may have more control over where they live, and particularly over what neighborhood they choose. Because frequent moves are not required, they may have greater residential stability than active-duty Airmen and thus greater exposure to neighborhood and base-area characteristics, such as poverty, crime rates, social support networks.

This report considers the possible impact that base-area social and economic climates can have on Airmen and their families; a large and growing body of research has found an association between neighborhood characteristics and individual-level health and well-being (Diez Roux and Mair, 2010; Kawachi and Berkman, 2003; Renalds, Smith, and Hale, 2010). If the social and economic characteristics of base areas do have an impact on Airmen and their families, and quality of those characteristics varies across bases, then how can the Air Force most effectively and efficiently meet the varying needs of its

members, especially in a period in which budgets are being slashed? The current model of resource allocation based on base population size may have undesirable unintended consequences, particularly at bases located in the poorest communities. For this reason, Air Force Services was interested in learning more about the potential impact of base-area characteristics and how it could counteract negative factors and leverage the positive ones. We assert that a more nuanced approach is warranted when the geographic areas containing AFBs vary in terms of their ability to support the needs of Airmen and their families.⁵

How Neighborhoods Could Influence Health and Well-Being

Three mechanisms have been implicated in the link between neighborhood characteristics and individual health and well-being. The first is collective efficacy, sometimes called *social capital* or *social cohesion* (see Coleman, 1988; Sampson, 2003, Putnam, 1996). These terms refer to various aspects of a neighborhood's ability to create a sense of community or togetherness among residents. They reflect the strength of social connections in a neighborhood. Neighborhoods high in collective efficacy are characterized as places where individuals know each other, where they have the capacity to reach collective goals, where people trust each other, and where informal social control can regulate behavior. Such high-quality neighborhoods not only can directly influence positive health behaviors through informal social control but also can promote psychological well-being through perceptions of social support and trust (Sampson, 2003).

The second linking mechanism is the quality of the neighborhood's infrastructure or resources. This includes abandoned buildings, broken windows, graffiti, access to parks and recreation, and pollution and air quality. The key aspect of this mechanism is the physical environment of the neighborhood. It is important to note that this mechanism can be either negative or positive, depending on the physical environment to which residents are exposed. Raudenbush (2003) found that exposure to social disorder—such things as abandoned cars and buildings, defaced property, garbage, drug paraphernalia, and public prostitution—are associated with worse physical health outcomes. However, other research has linked accessibility to parks and other green spaces to greater usage of such areas and ultimately to residents' physical and mental health (Lee and Maheswaran, 2010). Regardless of whether the physical environment is positive or negative, the key to

⁵ An earlier RAND proof-of-concept study addressed the variability and potential impact of base neighborhoods on Airmen using census and Air Force data from 2000 to 2003 (see Meadows et al., 2013).

this mechanism is the availability of resources (or lack thereof) necessary to promote community health and well-being.

The third linking mechanism is stress. Individuals who live in low-quality neighborhoods, which may be characterized by high crime rates and other signs of neighborhood disorganization, or social disorder (e.g., graffiti, broken windows), few areas for safe recreational activity, and little access to healthy food options, internalize the stress of living in such environments. This experience of stress affects physical health and well-being through physiological responses that mimic the body's "fight-or-flight" response, which is characterized by an increase in the release of certain hormones (e.g., adrenaline, noradrenaline, epinephrine, cortisol). Extended exposure to stress can result in the breakdown of important physiological processes, which, in turn, can have deleterious effects on cardiovascular, metabolic, immune, brain activity, or central nervous system functioning (McEwen, 1998). Some studies have found that health disparities across individuals in different neighborhoods can be attributed to differential stress levels experienced by area residents (Boardman, 2004; Matthews and Yang, 2010).

Outcomes Linked to Neighborhoods

Existing neighborhood research focuses primarily on health and well-being outcomes. In our previous exploration of the association between military base neighborhood characteristics and service member outcomes, we reviewed the literature and provided numerous examples of this research (see Table 2.2 in Meadows et al., 2013, for references). Common outcome measures include infectious diseases (e.g., sexually transmitted infections), chronic diseases (e.g., cardiovascular disease, diabetes, asthma), adult mortality, infant mortality, low birth weight, and infant health, health risk behaviors (e.g., smoking, drug and alcohol abuse), obesity, mental health (e.g., suicidal behavior, depression), and self-rated health.

Noticeably absent from this literature are studies that link subjective ratings of one's neighborhood to more-objective neighborhood quality indicators. For example, self-rated satisfaction with one's neighborhood, or perceptions of neighborhood cohesiveness and safety, may also be correlated with objective measures of neighborhood status (e.g., unemployment rates, education rates). In some sense, a high correlation between the two (i.e., subjective and objective measures) will validate that an index of neighborhood characteristics does, in fact, tap into a latent measure of quality. And, from the perspective of the Air Force, it may be important to know whether the use of services by Airmen and their families varies according to the quality of the neighborhoods. If use of on-base, Air Force-sponsored programs and facilities are indeed higher in lower-quality neighborhoods, then a disproportionate distribution of resources to those programs can be

justified as compensatory for the lack of quality programs or facilities in the community and meeting the needs of Airmen and their families. Thus, our analysis will include both more-traditional measures of Airman health and well-being and measures of community satisfaction and service utilization.

Qualities and Characteristics of Neighborhoods Linked to Outcomes

As noted in the previous section, certain aspects or characteristics of neighborhoods have been implicated in the neighborhood–health link. Two general types of indicators are available: objective and subjective (see Weden, Carpiano, and Robert, 2008). Most often, objective measures of neighborhood characteristics are related to the overall socioeconomic status (SES) of the area. These indicators include such measures as median income, poverty rates, and unemployment rates and are typically obtained from large demographic data sets, such as the census. Researchers tend to view this type of data as indicators of neighborhood *disadvantage* (Ross and Mirowsky, 2001, 2009), although some common measures, such as the percentage of residents with a college degree, tap neighborhood *affluence*, rather than disadvantage (Johnson, 2008; Massey, 1996).

A second set of objective neighborhood characteristics is those associated with researcher or observer assessments of a neighborhood’s general QOL. These include such things as crime and other measures of social disorganization (e.g., broken windows, abandoned buildings, graffiti) (see Raudenbush and Sampson, 1999; Sampson and Raudenbush, 2004) and the built environment (e.g., land-use mix, walkability, residential density) (see Sallis et al., 2009).

Because objective measures of neighborhood characteristics may not capture the experiences of residents, some research has used subjective measures of neighborhood quality (see Echeverria, Diez-Roux, and Link, 2004; Ross and Mirowsky, 2001, 2009; Schaefer-McDaniel, 2009). Such measures can include perceptions of safety, pollution, and social cohesion. The key to subjective measures is that they are obtained from residents themselves and not from administrative or census data. As such, the assumption is that subjective data more accurately convey the aspects of a neighborhood that are most salient for health and well-being (Cummins et al., 2007).

Both quantitative and qualitative metrics of neighborhood quality have been linked to health and well-being (see Cummins et al., 2007; Diez Roux, 2001; and Macintyre, Ellaway, and Cummins, 2002). However, fewer studies have simultaneously measured both types of measures to assess their differential impact. Weden, Carpiano, and Robert (2008) find that both do matter for health, specifically for depressive symptoms and self-rated health (net of other individual-level characteristics). But important to note is that, in

that study, perceived neighborhood quality (i.e., the subjective measure) was more strongly associated with health outcomes than were objective measures of neighborhood disadvantage and affluence. Further, subjective perceptions of neighborhood quality mediated the association between objective measures of neighborhood quality and health. That is, objective characteristics of a neighborhood (e.g., poverty, use of public assistance, education level, unemployment) were associated with individuals' perceptions of their neighborhoods, which, in turn, were associated with health (see also J. Kim, 2010). Unfortunately, as we note in the next section, the availability of subjective measures of neighborhoods and their characteristics is sometimes problematic.

Challenges to Applying Neighborhood Studies

Although the field of neighborhood studies has gained much ground in the past three decades, there are still challenges that have yet to be completely addressed. First, short of randomly assigning individuals to neighborhoods, we cannot definitely assert that neighborhood characteristics *cause* any given outcome at the individual level (for example, see McCormack and Shiell, 2011). Because individuals can and do select where they live, it is possible that other factors (e.g., wealth) are responsible for individual health and well-being outcomes, as well as residence (and, therefore, the characteristics of that residence). SES is a particularly difficult factor to rule out because neighborhoods are generally stratified by SES, and SES affects health (Diez Roux, 2001). Military populations are a unique case in which choice of neighborhood is constrained because service members are assigned to bases, although many have the ability to choose whether to live on or off base and, if off base, in which exact neighborhood they want to live. Those choices may be shaped by such factors as affordability of housing, school quality, crime rates, recommendations from their social networks or relocation or housing assistance programs, and whether service members have the opportunity to visit neighborhoods in person before deciding or whether they search solely from afar through the Internet.

Second, the definition of a neighborhood is not stable across time, individuals, or research question. *Neighborhood* can mean different things to different people. A recent qualitative study of adolescents and their parents found four factors that individuals use to define their own neighborhoods: physical and institutional characteristics (e.g., roads, parks, schools), sociodemographic characteristics (e.g., race or ethnicity, class of residents), perceived criminal threats both within and outside, and symbolic identities (e.g., shared values or history) (Campbell et al., 2009). These factors represent an individual's *subjective* identification of his or her neighborhood. Objectively, we can also measure an individual's neighborhood by using a standard geographic dimension—a

census block or tract, a ZIP Code, or a city boundary. To complicate matters even further, these “standard” geographic dimensions can shift over time. New ZIP Codes are sometimes created, for example. Ultimately, the research question that is being addressed may drive the decision of how to define *neighborhood*. If one is interested in neighborhood effects on teen smoking, it may be useful to define neighborhoods based on where teens spend their leisure time. But if one is interested in how the walkability of a neighborhood influences population-level obesity, it may be more useful to use a definition of *neighborhood* that ties closely with existing geographic boundaries.

The decision of how to measure neighborhood is closely tied with a third challenge of neighborhood research: where to get neighborhood data. If one uses individual-level, subjective definitions of neighborhoods, then census-tract data may be of little use because of the wide variability in how well they would match subjective definitions. However, if one needs data that can be consistently compared across specific geographies, or that are considered comparable across a large geography (e.g., across the entire United States), then standardized data may be more appropriate. In general, area data can come from individual perceptions, researcher observations, or official sources, such as the census or state or local governments. Some data can be obtained from for-profit or nongovernmental organizations, such as the National Association of Realtors, but often these data are proprietary, must be purchased, or cannot easily be matched to other geographic units of analysis.

A fourth challenge associated with neighborhood studies is how to combine multiple facets of neighborhoods. If one is interested in only one aspect of a neighborhood—say, the average SES—existing modeling techniques can easily accommodate such an analysis. But if the goal is to characterize neighborhood across multiple dimensions, across a set of different indicators, then we need a way to simply and efficiently, without sacrificing information, combine those neighborhood characteristics in a meaningful way. One mechanism for doing so is to use social indicators methodology to create a composite index of neighborhood characteristics.

Social Indicators Research and Composite Indices

Because a single model of health and well-being with dozens of neighborhood characteristics entered as predictors is unwieldy, it is necessary to use some method to combine those characteristics into one data point that is comparable across multiple neighborhoods. This is exactly what a composite index does. Social indicators methodology, which frequently makes use of such indices, is often used to compare or rank-order geographic units, such as nations, states, or cities, as well as groups of people (e.g., citizens of a country, children).

Social indicators research has a long history in the United States (Cobb and Rixford, 1998) and has been used to influence social policy. If we consider solely QOL studies, we see that policymakers have become increasingly reliant on composite indices to gauge the health and well-being of populations since the late 1990s (Land, 2000; Lippman, 2007) and, subsequently, to recommend policies that are aimed at areas where health and well-being have declined or are lower than some set standard. QOL indices make it relatively easy to combine multiple indicators yet, at the same time, allow for disaggregation of indicators when necessary. For example, one QOL index may combine measures of health among both adults and children. When child-only policies are of interest, policymakers can focus specifically on those indicators relevant to the subpopulation of interest. Such indices also make it easy to compare QOL over time, making them a sort of social barometer. Examples include the Index of Social Health (Miringoff and Miringoff, 1999), which uses 16 measures of social, economic, and health well-being to assess overall well-being among Americans, and the Child and Youth Well-Being Index (CWI) (Land, Lamb, and Mustillo, 2001), which similarly focuses on health and well-being but only of children and youths, by tracking some 25 national-level indicators.

The Relevance of Military Base Areas

Previous research has considered the role that on-base services and base-area neighborhood characteristics may play in the QOL and level of commitment to military service for military personnel and their spouses. For example, such resources as libraries, child and youth programs, child-care programs, fitness centers, and campgrounds, have been associated with satisfaction with military life (Booth, Segal, and Bell, 2007; Nord, Perry, and Maxfield, 1997; Westhuis and Fafara, 2007). Research has also explored how neighborhood school quality influences the housing choices of military personnel (Wenger and Hodari, 2002), how characteristics of job markets around military bases affect the employment of military spouses (Harrell et al., 2004; Hosek et al., 2002), and how child-care characteristics matter both for spouse satisfaction and for the performance of military personnel (MacDermid et al., 2008; Zellman et al., 2009). Research has considered the impact that military bases can have on the surrounding community as well, such as the influence on local labor markets (Booth, 2003) and on local health care safety nets (Gifford, 2005).

However, with the exception of an exploratory study conducted by the authors of this report (Meadows et al., 2013), social indicators methodology has not been used to convey, in a greatly condensed fashion, the types of information that could help the armed services understand variation across their installations and the role that the social

and economic factors might play in the health and well-being, QOL, or career commitment of their families and service members.

The Current Study

One important difference between the current study and existing neighborhood studies literature should be noted at the outset. The definition of *neighborhood* used in this study is generally much larger than that used in the existing literature (see Chapter Two for details). *Neighborhood*, in this case, is linked to employment (or base assignment), which is rarely the case in other studies. For these reasons, and to avoid confusion, we use the term *base area* rather than *base neighborhood*. Nonetheless, we still use similar concepts and methods from existing neighborhood studies.

The current study asks three primary research questions:

- How much variability is there in the social, economic, and demographic qualities of AFB areas?
- Is there an association between these area characteristics and Airman outcomes on
 - perceived health and well-being
 - perceived military and neighborhood social cohesion
 - ratings of neighborhood resources
 - use of on-base resources
 - satisfaction
 - career intentions?
- If an association exists, how might the Air Force use area factors in decisionmaking?

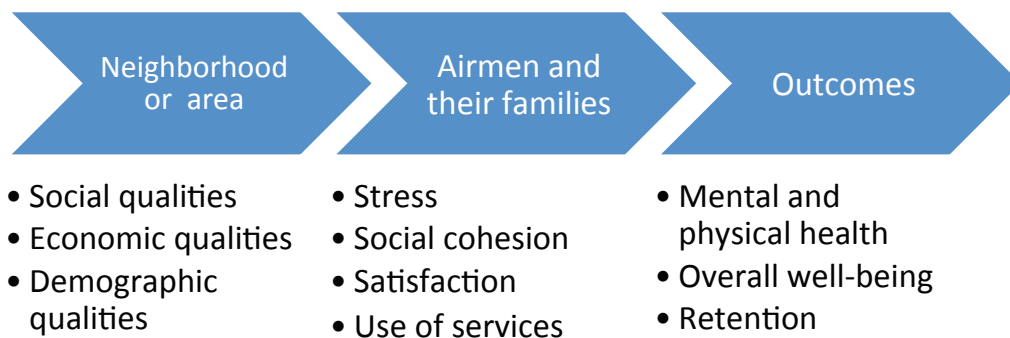
The main goal of this study was to provide the Air Force with data that may help it to determine how to more efficiently, and effectively, provide services, resources, and leadership to address the needs of its population by providing a composite look at base-area characteristics and how those characteristics may influence individual outcomes. Such a goal requires the use of a standard methodology not only to score bases and their surrounding areas but also to assess whether or not those scores are associated with self-reported measures of Airman outcomes.

Although providing the Air Force with one possible rationale for more-efficient, effective service provision was the main goal of the study, it is important to note that, in some ways, this goal is a means to an end. Ultimately, the Air Force is interested in many things that may relate to support services and programs. For example, appropriate mental and behavioral health care services may lead to fewer behavioral and health problems among Airmen and their families. If Airmen and their families are satisfied with the

services and programs provided to them, then overall satisfaction with the Air Force may also be high, and thus retention may be (positively) affected.

We offer Figure 1.1 as a backdrop against which to understand the context of this study. The model of neighborhood or area influence on Airmen and their family members is drawn primarily from the civilian literature (reviewed above). On the left of the figure are neighborhood and area quality: social, economic, and demographic. Those characteristics are then associated with an Airman’s stress levels, how integrated he or she perceives him- or herself to be both into the neighborhood or area itself and within the base or installation, how satisfied he or she is across multiple dimensions (e.g., life, the Air Force, the civilian area), and the extent to which he or she reports using services both on and off base. Although these factors could be considered outcomes in and of themselves, they can also be viewed as intermediary steps between neighborhood or area characteristics and quality and other more-distal outcomes important to the Air Force. These more-distal outcomes include such things as mental and physical health, general well-being, and retention. Our analysis will focus on both proximate outcomes (i.e., the center arrow) and more-distal outcomes (i.e., the last arrow).

Figure 1.1
Model of Neighborhood and Area Characteristics and Airman and Family Outcomes



In the next chapter, we provide more detail on the data and methods used in the analysis. Chapter Three presents results from the RAND Base Area Social and Economic Index (RAND BASE-I), which uses a social indicators approach to score base areas. Chapters Four and Five offer key findings from the multilevel models linking the RAND BASE-I to Airman responses to selected items on the Community Assessment Survey and the Caring for People Survey, respectively. These items correspond to the proximate and distal outcomes in Figure 1.1. And finally, Chapter Six summarizes the research and proposes policy implications based on the findings reported in earlier chapters.

