

The Relationship between Social Housing Design and Household Wellbeing: A Literature Review and Analysis of Inter-American Development Bank Projects

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Development Division

TECHNICAL
NOTE N°
IDB-TN-02314

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January 2022



Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

Zambrano-Barragán, Patricio.

The relationship between social housing design and household wellbeing: a Literature review and analysis of Inter-American Development Bank projects / Patricio Zambrano-Barragán, Anne Hudson, Sofía Viguri.

p. cm. — (IDB Technical Note ; 2314)

Includes bibliographical references.

1. Housing-Research-Latin America. 2. Housing-Research-Caribbean Area. 3. Low-income housing-Latin America. 4. Low-income housing-Caribbean Area. 5. Well-being-Latin America. 6. Well-being-Caribbean Area. I. Hudson, Anne. II. Viguri, Sofía. III. Inter-American Development Bank. Housing and Urban Development Division. IV. Title. V. Series.

IDB-TN-2314

JEL Codes: O18, O21, R21, R31, I15, I31

Keywords: housing; wellbeing; design; urban design; public health.

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Authors: Patricio Zambrano-Barragán, Anne Hudson, Sofía Viguri



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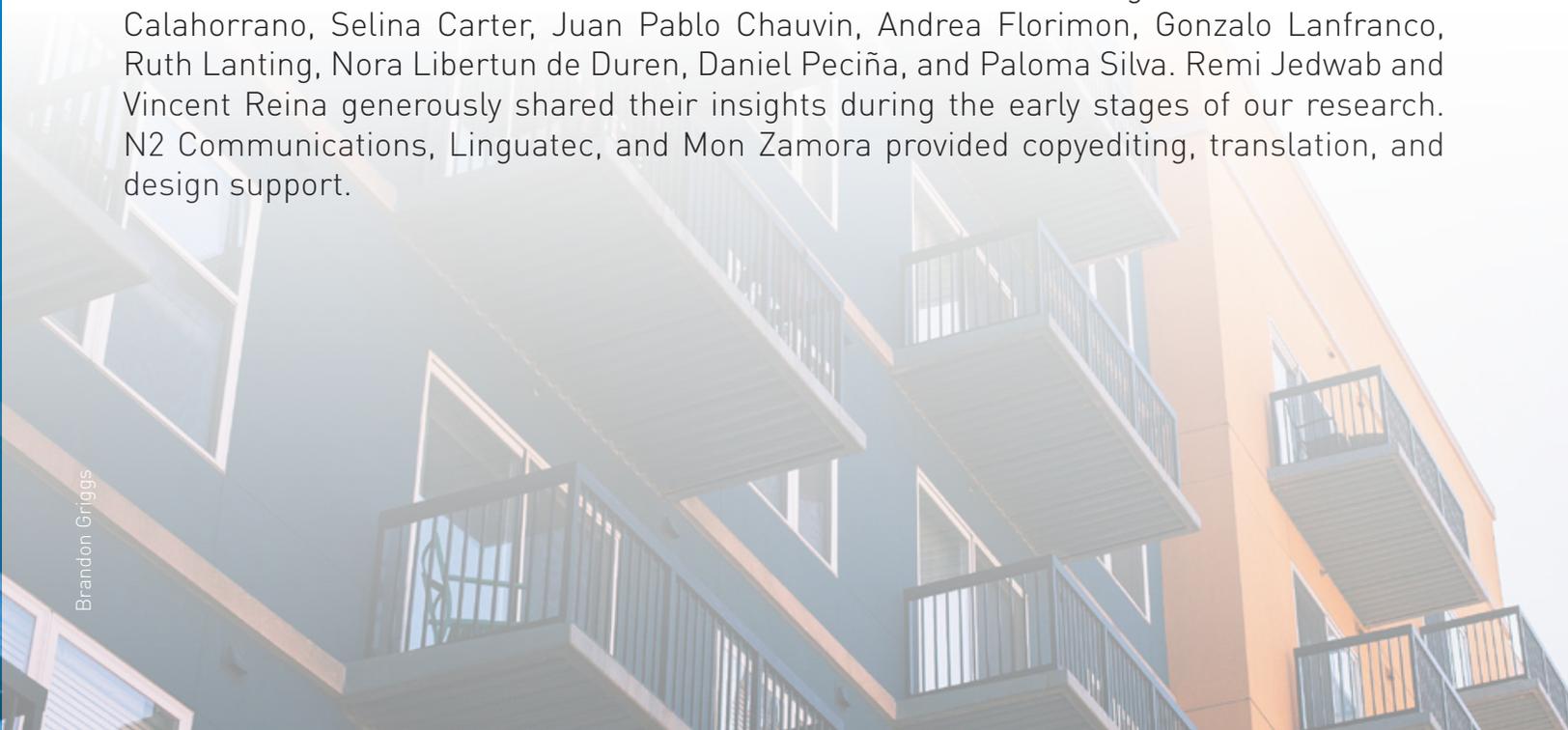
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Abstract

This technical note explores the relationship between housing design and household wellbeing, with a specific focus on Latin America and the Caribbean (LAC). The research on the economic and social impacts of adequate access to housing is well established. However, the various impacts of housing design—the architectural, engineering, and site-planning features present at the unit and neighborhood scales—are comparatively less well understood. To address this gap, first, we present a literature review of more than 200 articles on the topic, with a special focus on references (both theoretical and empirical) that explore links between at least one design element and at least one aspect of wellbeing. Second, we include an analysis of how questions of design are resolved in existing housing programs. Specifically, we present a critical assessment of a sample of 26 public sector projects funded by the Inter-American Development Bank (IDB) in various LAC countries from 2009 through 2019. Overall, by highlighting key methodological challenges and potential avenues for future research, this paper serves as a reference for practitioners seeking to assess why and how best to incorporate design into social housing programs and maximize positive impacts on wellbeing.

Acknowledgments

This technical note was funded by Inter-American Development grant RG-E1659. We are thankful to the Inter-American Development Bank's (IDB) Climate Change and Sustainable Development Sector and the Housing and Urban Development Division for this support. The authors would also like to thank the following people for their contributions. At the IDB: Paloma Acevedo, Maria Elena Acosta, Allen Blackman, Janaina Borges de Padua, Karina Calahorrano, Selina Carter, Juan Pablo Chauvin, Andrea Florimon, Gonzalo Lanfranco, Ruth Lanting, Nora Libertun de Duren, Daniel Peciña, and Paloma Silva. Remi Jedwab and Vincent Reina generously shared their insights during the early stages of our research. N2 Communications, Linguatec, and Mon Zamora provided copyediting, translation, and design support.



1 — Introduction

1.1 Housing Design and the Broader History of Housing Policy

Throughout their history, Latin American and Caribbean (LAC) governments have been centrally concerned with providing adequate housing to low-income households. Rapid urbanization, primarily through the migration from rural to urban areas, has been a constant in the region since the mid-twentieth century (Amsden 2007; Bértola and Ocampo 2012; UN 2014). There has been an accompanying demand for housing that, for low-income households, often reflects qualitative deficits (overcrowding, poor construction materials, lack of access to basic infrastructure, exposure to natural hazards, and lack of tenure security) and, in many LAC countries, is typically met through informal means. Despite progress over time, recent regional estimates show that some 25% of households still lack access to adequate housing (Bouillon 2012; Adler and Vera 2018). State-led programs that have sought to redress these conditions respond to a host of market issues, in terms of both demand, particularly a lack of household income, and supply, such as a limited availability of serviced land, underdeveloped mortgage markets, or limited access to well-located units (Ferreyra and Roberts 2018; IDB 2020).

The goals of state-led housing programs in LAC have changed over time, as practitioners, scholars, and beneficiary communities have sought to assess impacts and highlight lessons and mistakes. Though there are differences between and within countries, broadly speaking, the region has seen a common evolution regarding the goals of social housing. In the decades following World War II, when the region experienced the dual phenomena of unprecedented economic growth and rapid urbanization, the preferred strategy was for the state to directly build social housing at scale (Almandoz 2010; Davis 2014). Starting in the 1960s and through the 1970s, countries gradually shifted their strategies toward sites and service programs: serviced land for low-income households in combination with a secure title (Turner 1976; Rojas 2014; Offner 2018; Gyger 2019). From the 1980s to the 1990s, housing policy in particular switched to an “enabling approach,” which sought to increase private sector participation by combining demand-side support, in the form of mortgage subsidies and other mechanisms, with supply-side assistance to developers and banks (Angel 2000; Buckley and Kalarickal 2006). The early 2000s saw improvements in macroeconomic performance, which led to a renewed emphasis on state-enabled, private sector development; this shift allowed for the larger-scale delivery of housing units. However, this approach has led to inaccessible development and considerable spatial segregation, as evident in countries such as Mexico and Chile (Tokman 2006; Monkkonen 2012; Cohen et al. 2016).

What role has design played in this evolution? Design refers to prescribed architectural and engineering features, which, at the unit level, may include construction materials and techniques, the number and functionality of rooms, and building performance. At the neighborhood level, additional design considerations include the lot size, distance to amenities and services, and height and setbacks. To illustrate this role using examples that track the evolution discussed earlier, consider an emblematic example of the sites-and-services approach, Peru's PREVI-Lima housing project (1968), which sought to build 1,500 new units for previously informal settlers. The project allowed families to self-build legally within a state-sanctioned site, so long as they respected predetermined features, such as having two to three stories maximum and an inner patio (Kahatt 2011; García-Huidobro et al. 2011). For a more recent example, consider Ecuador's Casa para todos program. Launched in 2018 and partially supported by a US\$93.9M IDB loan,¹ the program, which offers subsidies to households to build or purchase a new home or to access a commercial mortgage, requires that beneficiary single-family homes have an area of at least 50 m² and no more than 57 m² (individual unit design) and sit no farther than 400 m from a public space (neighborhood-level design). These are but two examples among countless others that show notable specificity regarding design—although, naturally, other programs remain silent on these issues.

We argue that the ways in which social housing programs address questions of design should reflect an underlying belief about how standards and prescriptions can improve household wellbeing. This belief has only grown stronger considering the impacts of the COVID-19 pandemic, which have been particularly devastating for LAC's most vulnerable populations. As the authors have highlighted elsewhere, the drivers for this disparate impact are manifold.² Yet, it is impossible to ignore the role of housing design: alongside a lack of access to basic services, factors such as poor ventilation and overcrowding have impeded people's abilities to observe basic health measures, while, at the neighborhood scale, a lack of access to public space and other amenities have exacerbated the economic, social, and health impacts of the COVID-19 pandemic.

1. Program information available at <https://www.iadb.org/en/project/EC-L1245>.

2. "Chronic underinvestment in public health systems, limited or unambitious fiscal stimuli, and reduced access to vaccines top the list" in the early stages of the pandemic (Zambrano-Barragán 2021).

1.2. Understanding the Impact of Housing Design

Previous research has documented the impacts that access to adequate housing can have on wellbeing, particularly on social and economic outcomes such as income, education, and employment. As a basic good, housing can represent an important portion of household wealth—at least for homeowners, who tend to experience social and economic security across all income levels (DiPasquale and Glaeser 1998; Rohe et al. 2001; Boehm and Schlottmann 2008; Case et al. 2011; Coulson and Li 2013). Its location also affects households' access to education and other urban services, for renters and owners alike; poorly located housing can have disproportionate negative impacts on people's access to jobs (Kearns and Parkinson 2001; Briggs 2005; Zárate 2020). And beyond individual households, the performance of housing markets can have a considerable impact on broader economic conditions: the housing sector represents from 11% to 16% of the national GDP in higher-income LAC countries (Rojas 2014; Acolin and Hoek-Smit 2020).

The research on the impacts that housing design has on wellbeing is comparatively smaller, though by no means less rich. This is partly due to the complex relationship between specific aspects of design—e.g., materials, room size, distance to parks—and different dimensions of wellbeing. A second reason for this relative gap, not exclusive to design, is the difficulty in examining the subjective aspects of wellbeing and their relationship to housing, which is a nascent and increasingly important field of study. Finally, there is a notable lack of case studies and empirical research from countries and cities in the Global South. The housing design-wellbeing nexus thus offers fertile ground for theoretical and empirical inquiry.

The paper has three sections. Following this introduction, Section 2 presents the results of a literature review, whose goal is to understand and define the relationship between design and wellbeing, explore previous methodological approaches to examine this link, and identify specific knowledge gaps. Section 3 presents a critical evaluation of how specific social housing projects in LAC have approached the question of design: how design was defined and implemented, as well as how (and if) its impacts were measured. We gathered data that was readily available to us: documentation from 26 IDB-financed social housing projects from 2009 to 2019. Sections 2 and 3 end with their respective conclusions and recommendations.

We note that this technical note is part of broader efforts from the IDB's Housing and Urban Development Division, which, over the last few years, has published research to provide a theoretical and empirical basis to improve how state-led housing programs are designed, implemented, and evaluated, with a specific focus on LAC. Our primary audience is therefore decision-makers and researchers in the region's housing ecosystem (including international development practitioners such as those working at the IDB and its sister institutions), though we hope this work proves relevant for other disciplines and geographies, as well.

2 — Literature Review

This review has six sections. We start by providing an overview of our methodological approach (2.1), followed by a brief discussion of the concept of wellbeing and the methodological challenges associated with its measurement (2.2). Next, we structure the subsequent sections according to themes identified in our survey of the literature: Section 2.3 focuses on the impacts of neighborhood design, Section 2.4 focuses on the impacts of housing unit design, and Section 2.5 highlights cross-cutting themes. The review concludes with a brief summary of our findings and recommendations for future research.

2.1. Methodology

This review aims to assess the current state of knowledge at the intersection of two topics—housing design and wellbeing—and identify avenues for future research, following Finfgeld-Connett and Johnson’s (2013) review model. We took a hermeneutic approach: an open-ended, iterative critical search process through which to define themes and refine potential research questions (Boell and Cecez-Kecmanovic 2010). In line with this hermeneutic approach, we gradually organized references based on topics (as opposed to, say, authors; see Webster and Watson 2002), while also “tagging” references based on geography, given our specific interest in LAC and, more broadly, research from the Global South.

We examined more than 200 articles, including systematic literature reviews, with a special focus on references (both theoretical and empirical) that explore links between at least one design element and at least one aspect of wellbeing. From this set of references, we drew out organizing themes that correspond to different aspects of design, i.e., elements from the neighborhood level down to the housing unit, identifying in all instances those aspects of wellbeing impacted by specific design choices. While our overall research project hopes to engage primarily with social housing schemes, to ensure a full capture of the relevant references, we did not filter our results according to public versus private housing.

2.2. The Concept of Wellbeing

This paper does not provide a detailed review of the wellbeing literature, which has a rich and long history. Rather, we provide a brief overview of the methodological issues associated with wellbeing research. In turn, this overview serves as a point of reference when discussing how the works discussed below tackle methodological challenges and how researchers deploy innovative approaches to understanding the link between housing and wellbeing.

Defining and measuring wellbeing is one of the primary and most common challenges found in the literature. As seen below, a large portion of the studies on the impacts of housing focuses on aspects of wellbeing that are relatively easy to measure, such as economic and educational outcomes. Yet, most of the studies included here acknowledge that, to fully understand how housing affects people requires a wider, more comprehensive conception of wellbeing. In addition, researchers increasingly acknowledge that interdisciplinary work, mixed-methods research, and a multidimensional approach could improve studies of “wellbeing” (Lindert et al. 2015; Linton et al. 2016).

The debate about how to define wellbeing is as rich and long as the discussions on how to measure wellbeing. Generally, there is a tendency to differentiate between objective measures (such as mortality rates) and subjective ones (an individual’s perception of stress)—though subjectivity and objectivity are interrelated, in that what is objectively true affects perception, and perceptions can result in changes to on-the-ground truths (Dodge et al. 2012). And while we know that interrelations exist, we do not always know their exact nature.

Researchers may prefer one type of measure over another, depending on their ease of use, applicability, or comparability (Gasper 2010). Different measures of wellbeing and quality of life reflect the traditions on which they are based, for example, “the subjective well-being tradition from psychology; quality-of-life work in health sciences; the economics-based tradition of ‘utility’ estimation; theories of human need and/or capability; poverty studies; studies of community quality-of-life and social fabric; and overarching quality-of-life constructs” (Gasper 2010, p. 21).

From a methodological perspective, we note that several of the studies included in this review focus on so-called subjective wellbeing (SWB), particularly measures such as life satisfaction, residential satisfaction, and happiness. This focus responds to two factors. First, according to Clapham et al. (2018), SWB indicators, which tend to have a standardized measurement approach and are typically gathered through self-reporting tools, are a valid proxy for “observable” measures of wellbeing, as found in panel or census data. Taken alone, however, such data can obscure the fact that individuals cannot be considered purely rational, utility-maximizing entities. Second, housing has a symbolic significance for citizens and communities, beyond shelter and even beyond the associated economic goods and services. As Kohn (2003) argues, the homes, neighborhoods, and cities where they live alternately enable and constrain how individuals come together, demarcate social behaviors and interactions, and, ultimately, define how individuals experientially understand social life and political order. Objective and independently gathered economic and social indicators provide an incomplete picture in this regard.

Traditions aside, researchers focused on the measurement of wellbeing broadly recommend adapting definitions and measures to both geographic locations and participants (Camfield 2004; Phillips 2006; Linton et al. 2016). Nonetheless, comparatively fewer applied frameworks have been developed specifically for countries and cities in the Global South (though we note that scholars from a critical tradition have actively engaged with this subject, particularly in relation to debates about the meaning of “development”; see, e.g., Mazlish 1963; Escobar 1995; Sen 2000; Ferguson 2015). Though some of the studies included in the following sections do seek to apply wellbeing measures to developing country contexts and, tellingly, to urban contexts where housing is primarily informal (Cattaneo et al. 2009; Gómez et al. 2010), fewer works attempt to propose a new theory for how to tackle the problem more widely (Moya Garcia and Way 2003; Camfield 2004).

Some of the most widely used measurement frameworks include specific aspects related to housing and neighborhoods. The OECD Better Life Index conducts regular statistical reports on wellbeing outcomes across 41 countries. Its multidimensional framework includes built environment aspects, such as the share of households living in overcrowded conditions, access to green spaces, and feelings of safety (OECD 2020). The World Health Organization Quality of Life (WHOQOL) survey, last updated in 2012, seeks to measure household satisfaction with access to health services (WHO 2012). Other widely used wellbeing indices and measures, such as the Gallup-Sharecare Well-Being Index (Gallup 2020), include questions about accessibility, density, and other design features included in this review.

2.3. Neighborhood-Level Studies

The “neighborhood effects” literature originated from a now well-researched observation: people living in disadvantaged neighborhoods face negative impacts on a number of long-term outcomes (beyond individual characteristics), such as educational achievement, health, social exclusion, and labor mobility. In the context of our discussion of housing, these effects respond to the fact that housing is more than just “four walls and a roof.” When a citizen or family chooses a home to live in, they are looking for a place that can safely and adequately meet their basic shelter needs. Yet, by choosing a neighborhood, they are also securing access to a bundle of services: public goods (e.g., school and health facilities, and public space and parks), proximity to jobs and leisure, and an opportunity to belong to, and feel pride in, a specific community.³

The bulk of the neighborhood effects literature comes from the United States and Europe. Empirical studies have broadly focused on the long-term impacts of neighborhood conditions (including the relative benefits of homeownership) on economic outcomes that are comparatively easier to measure, such as educational attainment, employment, and income—particularly for children (Jencks and Mayer 1990; Rossi and Weber 1996; Cutler and Glaeser 1997; Chetty et al. 2016), as well as social factors such as criminal involvement and teen sexual activity (see Ellen and Turner 1997 for a systematic review). Housing tenure, particularly homeownership, has also been shown to have positive economic and health impacts, although the causal links are the subject of debate (Rossi and Weber 1996; Haurin et al. 2001; Shaw 2004; Diaz-Serrano 2006). In the United States, important work has been done at the crossroads of neighborhood effects research and neighborhood “mix”; Sharkey (2013) and Sampson (2012) show persistent issues regarding racial segregation and its link to inequality at the national and city-specific levels.

Galster (2019, ch. 8) provides a framework for how neighborhood effects work. He identifies four major types of interaction: social-interactive, such as the presence of social networks or parental mediation and care; environmental, including exposure to violence or toxic elements and pollutants; geographical, including access to jobs and services; and institutional, including local institutional resources and agencies. The author notes that there are, broadly, two main approaches to measure neighborhood effects: on-site, qualitative research (such as field interviews) and quantitative analysis (typically multivariate statistical research).

3. From the perspective of economics, mobile households compete for access to locations that provide their optimal balance of housing services and taxes, and thus sort themselves across municipalities and neighborhoods to maximize their utility (Tiebout 1956; O’Sullivan 2009). Higher-income households prefer neighborhoods with better access and public goods, outbidding and displacing lower-income households and eventually leading to income segregation; lower-income neighborhoods would represent a lower tax base and an overall “deficient” bundle of housing services (O’Sullivan 2009).

Despite this wealth of research, important challenges remain. Reflecting on the gaps in the neighborhood effects literature, Maarten van Ham and Manley (2012) note that qualitative approaches may suggest a potential causal link, while causal experimental studies do not show significant causal links but rather suggest correlations between neighborhood characteristics and individual outcomes. Indeed, isolating the causality between “place” and wellbeing outcomes remains an important challenge in the effects literature, as is the need to study compounded effects over time, even across generations (Galster 2012). As Ellen and Turner (1997, p. 833) argue, “efforts to identify which neighborhood characteristics matter most, and to quantify their importance for families and children, have been inconclusive.” Another avenue for future research is the need to expand the range of dependent variables included in empirical studies and incorporate more subjective outcomes, such as happiness.

Finally, some studies caution against environmental determinism—the assumption that specific spaces or places can unidirectionally drive and explain neighborhood effects. Instead, these researchers call for a more “relational” understanding of the relationship, one that recognizes how sociodemographic and cultural factors such as age, sex, employment status, ethnicity, and religion, as well as broader economic and political constraints, create a dynamic interaction between place and people (Cummins et al. 2007). For example, access to health care is not simply a matter of Euclidean distance. Consider, as we have noted elsewhere, how migrants without legal status face discrimination and misinformation barriers when visiting nearby health centers and may either have to travel farther for proper access to health care or rely on extralegal services from a close network of community assets (Zambrano-Barragán et al. 2021). Similarly, other studies have sought to provide a more robust framework to study “place” by applying a “complex systems” approach: they recognize that neighborhoods are, for instance, causally complex, nonlinear, and socio-spatially open-ended, among other characteristics (Castellani et al. 2015). This relatively untested framework calls for a mix of methods and tools, from geospatial statistics to social network analysis.

With these considerations in mind, we provide a thematically organized overview of the research, below. We focus on specific aspects of design—each boasting its own distinct wealth of research, as will be shown—and summarize how previous research has sought to establish links to, or impacts on, specific outcomes or aspects of wellbeing. The themes or design features include density, accessibility, public space, mixed use, and other urban design elements.

Density.

At the neighborhood scale, the basic definition of density is the number of people living in a demarcated area. The results on the impacts of density on diverse aspects of wellbeing are mixed, reflecting an evolving attitude toward the topic. Research from the 1990s highlights, for instance, that communities in rural areas show higher life satisfaction than urban populations do (Davis and Fine-Davis 1991). However, starting in the 2000s, studies question whether density has any impact at all. For example, in their study of Queensland, Australia, using structural equation modeling, McCrea et al. (2006) find no strong link between observed density and subjective quality of life. More recently, still other studies find that there is no distinct positive or negative relationship between density and subjective wellbeing (Florida et al. 2013; Ambrey and Fleming 2014).

Studies of density highlight negative as well as positive impacts. In a quantitative study focused on high- and low-density neighborhoods in Piedmont, Italy, Fassio et al. (2013) find that residents of areas with high population density show lower levels of psychological health and relational and environmental quality of life. Another study, from Bandung, Indonesia, which uses self-reported life satisfaction as a proxy for quality of life, finds that compact development (higher-density neighborhoods) does not translate into improved quality of life (Arifwidodo and Perera 2011). The authors pointedly argue that these findings show that policy-makers should not adopt blanket “compact” design requirements without tailoring them to the specific characteristics of cities in developing countries. In addition, the results from Italy and Indonesia may confirm the conclusion that objective indicators, such as density, are weak predictors of satisfaction (Cummins 2000; Evans and Huxley 2002).

In contrast, studies such as Troped et al. (2010) show that density can improve wellbeing measures such as exercise, a result that, broadly, connects to some of the conclusions included in the Walkability section, below. Given conflicting findings on the impacts of density, we agree with Mitchell’s (1971) decades-old but still prescient observation that, more than density as an isolated aspect, it is the quality of the neighborhood that can help density yield the benefits expected.



Access to transportation.

Accessibility measures the ease with which households travel to desired destinations, whether local, such as a neighborhood grocery store, or regional, such as those concentrated in “central” districts (Ewing and Cervero 2010). This includes both where individuals live in relation to their destinations, their efficiency of travel, and their ease of travel. As discussed below, a lack of accessibility to jobs, for example, has been shown to be associated with greater income inequality (Segura 2018). For the purposes of this section, we focus on access to transportation and ease of commute, as accessibility at the larger scale is an agglomeration of several different design elements, including land-use mix.

An important body of literature surrounds the adverse mental and physical impacts of commuting behaviors, including findings that longer commutes are associated with higher rates of absenteeism at work; that traffic is associated with increased psychological distress; and that longer commutes have a negative impact on health (Costal et al. 1988; Yang and Matthews 2010; Hansson et al. 2011). Regarding access to different modes of transportation, Leyden et al. (2011) find a positive correlation between the perception of convenient access to public transportation and subjective wellbeing. Balestra and Sultan (2013) find that access to public transport exerts an effect on residential satisfaction. Nonetheless, some studies find that life satisfaction is inversely correlated with accessibility to potential destinations—albeit with small effects (Berry and Okulicz-Kozaryn 2011). This might suggest that travel behavior should not be dealt with independently, but rather in the context of larger-scale design efforts.



Public space.

There is a growing interest in the study of public space and its relationship to various aspects of wellbeing, particularly health. (Note that we separate public space from green space, discussed below, which can be either public or private. “Green space” refers more concretely to access to nature or natural elements). Typically, the relationship between public space and health is mediated by a specific activity—such as exercise or social interaction—that can be facilitated through access to public space. Thus, our review shows that empirical research on the direct impacts of public space presents challenges, given the difficulty of measuring how specific characteristics relate to specific aspects of wellbeing. To illustrate this complexity, we highlight Abdulkarim and Nasar’s study (2014), which finds that seating, triangulation, and access to food increase the “restorative” nature of plazas, i.e., spaces that can help restore mental or physical health. Other studies find that the presence of communal space, at both the neighborhood and housing scales, are associated with greater social capital (Zhu 2015; Cerruti and Shepley 2016).

The COVID-19 pandemic has drawn attention to the relationship between public and green space and physical and mental health. Samuelsson et al. (2020) highlight that urban nature plays an important role in maintaining wellbeing, as it can provide positive wellbeing effects, while helping people maintain social relationships even with social distancing measures. Slater et. al. (2020) argue that the pandemic has limited people’s options to access parks and green space, thereby reducing the potential benefits of physical activity for physical and mental health. A recent survey of citizens in six European countries highlights the importance of public space for exercise and relaxation, as well as for social encounters (Ugolini et al. 2020). While the study does not seek to establish causal links between public space and health during the pandemic, it does provide evidence of growing citizen demand for more easily accessible public space.



Green space.

Similarly, the topic of access to green space has gained attention in recent years. While this research overlaps with researched related to the impacts of public space, here, we focus specifically on parks, gardens, and spaces broadly considered to offer access to nature. The literature focuses on two main elements: the psychological impacts of proximity to parks and green space, and the links between green space and physical health, particularly as concerns obesity.

In their study of five neighborhoods in Beijing, China, Dong and Qin (2017) find that among elements such as floor size (see next section) and mixed land use, proximity to an urban park was alone in showing a significant and positive effect on subjective wellbeing. Earlier studies find that viewing nature on a daily basis reduces stress (Ulrich 1979); that the presence of trees near public housing can be linked with reduced incidents of domestic violence (Sullivan and Kuo 1996); and that access to windows overlooking green space is associated with higher cognitive functioning in children (Wells 2000). In a study that combines self-reported and national survey data, Bertram and Rehdanz (2015) find that green space has a positive effect on life satisfaction and, more specifically, that within a 1 km area, the amount of green space that leads to the highest satisfaction is 35 ha (11%).

A host of studies connect proximity to parks with increased physical activity, which, in turn, can lead to better physical and mental health, as well as lower rates of obesity (Giles-Corti and Donovan 2002; Gordon-Larsen et al. 2006; Sallis et al. 2012). Similar studies find that greater access to parks, combined with recreational programs, decrease the rates of obesity in children (Dunton et al. 2009; Wolch et al. 2011; Wolch et al. 2014).



Mixed use.

Mixed use, understood as the conscious integration of residential and commercial activities—as well as multifunctional streetscapes—in land use and zoning plans, has arguably become a central tenet of contemporary urban planning (Jacobs 1961; Talen 2008; Leinberger 2009; Duany et al. 2010). The call for mixed use is intimately connected to concerns about social and spatial segregation and accessibility in social housing (i.e., housing sites that concentrate poor families and sit far from jobs and services). Despite this “orthodoxy” regarding mixed use, there is surprisingly limited empirical research on its impacts on wellbeing, in large part because of the methodological difficulty of quantifying the different characteristics of mixed use. In the field of transportation planning, residents of mixed-use neighborhoods have been shown to favor nonmotorized as well as mass transit modes (Cervero 1996). In a critical review of the theoretical and empirical research, Paranagamage et al. (2010) identify correlations between mixed use (as well as other neighborhood characteristics, such as safety and public space) and increased social capital. A study focused on the impacts of mixed use on older men finds that a richer retail mix improves access to amenities and facilitates walking, but may increase instances of depression (Saarloos et al. 2011). An empirical study with participants from Montreal, Canada, finds that access to a wide diversity of services and amenities increases social participation, which in turn can translate into positive health outcomes (Richard et al. 2009). In a study using structural equation modeling to assess the impacts of neighborhood characteristics on life satisfaction, Cao (2016) finds that mixed use has an “insignificant” effect overall on positive and negative impacts.



Urban design.

While we have tried to identify the prevalent aspects of neighborhood design, numerous other prescriptions and recommendations also merit attention. For the purposes of our review, it is important to highlight that these design characteristics deepen the inherent difficulties of empirical research (regarding which specific features matter more, how much, and for which aspects of wellbeing). Further, the capacity to measure a design characteristic often determines what the research can examine and include.

One common approach is to include variables associated with design elements (such as street connectivity or openness) in statistical regressions, to discern which ones indicate some correlation with wellbeing. For example, Lindal and Hartig (2013) find that architectural variation has a positive effect on restoration potential, thereby leading to positive economic benefits, while building heights have a negative effect.⁴ Similarly, in an empirical study in Sevilla, Spain, Galindo and Hidalgo (2005) find that perceived “openness” in built environments can increase restoration and reinvestment potential. Through hedonic modeling for London neighborhoods, Chiaradia et al. (2009) find that good urban design can increase social and economic value. In an innovative study that compiles and rates streetscape images, and statistically explores the links between physical features and urban design quality ratings, Ewing et al. (2016) find that a number of design-based urban streetscape variables separate from street network design, such as “imageability,” “enclosure,” and “human scale,” are associated with greater walkability. In a study of Utrecht, Ettema and Schekkerman (2016) combine survey data with broad neighborhood data from the national statistics bureau, including the number of new dwellings, the number of firms per area, and accessibility to services. The authors find that subjective views of neighborhood characteristics have a positive impact on life satisfaction, while the presence of new housing stock is associated with better mental health. Finally, we note a more direct way in which streetscape design can impact wellbeing. In a study focused on German communities, household members living close to motor highways are found to have a greater exposure to air pollution, which, in turn, is associated with adverse health impacts and negative impacts on life satisfaction (Gehring et al. 2006).

 4. “Restoration potential” is a term from the field of environmental psychology that refers to the positive effect that experiences in certain environments can have in helping people recover from fatigue and improve their attention. See Kaplan 1995.

2.4. Housing Unit Studies

In contrast to the literature on neighborhood design and wellbeing, studies of the impacts of housing are more ample. In line with our observations from neighborhood-level studies (indicating that it is challenging to establish a causal link between specific design aspects and dimensions of wellbeing), we find that this subset of the literature on housing has a narrower focus, on metrics that are comparatively easier to measure, particularly health.⁵ In addition, there are comparatively more studies of and from developing countries, which is likely due to the prevalence and persistence of inadequate and informal housing, from poor materials to lack of access to basic services (so-called “qualitative” deficits).

As an entry point to the research on the design–health link, we highlight a few systematic reviews. Thomson et al.’s (2009) systematic review searched through 42 global bibliographic databases for studies carried out between 1887 and 2007. Following a rigorous selection process, they identify 45 references, both qualitative and quantitative, and conclude 1) improved heating systems in housing lead to better respiratory and mental health; 2) in the developing world, improved access to amenities can reduce illness; 3) some studies suggest housing improvements are also associated with positive impacts on the socioeconomic determinants of health; and 4) a few reports show adverse impacts following improvements. More recently, with an exclusive focus on quantitative studies, Ige et al. (2019) identify 39 references that largely confirm Thomson et al.’s findings, particularly regarding thermal and ventilation improvements.

For locations in the United States, Saegert et al. (2003) review 12 databases and identify 72 studies of housing improvements, including not only design features but also behavioral change interventions. Most of the research they review reports statistically significant improvements in specific health conditions, such as instances of respiratory disease or exposure to toxic agents. Shaw’s (2004) review gathers relevant research, especially from the United Kingdom, while also offering a useful framework to understand the potential causal links between different aspects of housing, from the home to the neighborhood, and different aspects of wellbeing, including a critical discussion of the “meaningful” and symbolic dimensions of housing. Meanwhile, a review by Evans et al. (2003) focuses specifically on the link between housing and mental health. The authors exclude neighborhood-level research and focus instead on housing features such as type (single-family versus multifamily), building height, and structural quality. In 38 studies reviewed, they find sufficient evidence to support their finding that housing impacts psychological health, especially for low-income families with young children.

5. Efforts to reveal and improve the link between housing and health have a rich history. The establishment of urban planning as a distinct, professional discipline can be traced to the late nineteenth and early twentieth centuries, as a response to poor living and sanitary conditions in rapidly growing industrial cities around the world (Peterson 2009; Almandoz 2010; Bonduki 2014; Hall 2014).

The WHO Housing and Health Guidelines (2018) is a robust report that includes both a systematic review of previous research and direct prescriptions shown to reduce health-risk factors. The report organizes topics in the following categories: crowding, indoor temperature, home safety and injuries, and accessibility (understood as building-level accessibility for people with functional impairments). These categories can be mapped onto the categorization used in our discussion of Housing Unit Studies, further demonstrating the strength of the link between unit design and health.

To complement the findings from these literature reviews, we provide an overview of references categorized by specific design elements: basic structural features—including building performance—and size and type. Also, we briefly discuss the construction process, particularly the concept of incremental housing, which refers to low-income households' ability to self-build over time, after receiving improvements to basic infrastructure and the title to urbanized land (Wakely and Riley 2011; Adler and Vera 2018).



Basic structural features.

There is strong evidence that poor housing quality has an adverse impact on both physical and mental health. This link is evident across numerous features of the housing unit, each associated with one or more dimensions of health. Inspired in part by Howden-Chapman's glossary of housing and health (2004), we define "basic structural features" as: the construction materials and structural elements that are crucial for a house to provide a basic shelter function, such as floor type or wall materials, as well as the absence of structural threats such as water leaks or rot (though some deficiencies, such as dampness, can result from housing location); features that are crucial for households to satisfy their basic needs, such as safe and good-quality access to electricity, water, sanitation, and basic infrastructure services, including heating in areas with extremely cold temperatures; and features within the environment of the house that can enhance or limit its shelter function, such as ventilation or insulation.

Regarding basic housing materials, we highlight Cattaneo et al.'s (2009) empirical study of the impacts of a Mexican social housing program (Piso Firme) to replace dirt floors with cement floors. This quantitative study, one of the few and most often cited works from Latin America, finds an association between the change in floor materials from dirt to concrete and a decrease in the prevalence of disease among children. Notably, they also find improved scores regarding stress levels and depression among adults, as well as increased residential satisfaction. In a pan-European study of housing conditions, Fernández-Carro et al. (2015) find that a lack of access to electricity and plumbing is associated with poor physical health and, similarly to Cattaneo et al., find that structural features are linked to overall residential satisfaction.

In terms of thermal performance, as mentioned earlier, there is wide agreement within the literature that dampness and temperature variations can have negative impacts on health. Dampness has adverse effects on the respiratory health of both children and older adults (Verhoeff et al. 1995; Shaw 2004). In a study set in Scotland, Gemmell (2001) finds that indoor temperatures are more determinant of seasonal variations in mortality than outdoor temperatures are.

Other studies go beyond the basic structural functionality of housing to investigate building performance and its potential impacts. As part of a study that seeks to contribute new approaches to measuring wellbeing, Fujiwara (2013) notes that poor lighting in housing is associated with lower life satisfaction. In a critical review of housing interventions that seek to improve health, Gibson et al. (2011) note that energy efficiency in buildings has an indirect positive impact by increasing warmth (though the authors warn of less conclusive links between neighborhood-level interventions and health). Nonetheless, citing studies from the United Kingdom, Davies and Oreszczyn (2012) argue that if not properly designed, measures to reduce the carbon footprint of buildings, such as energy efficient insulation, may increase exposure to pollutants. Deploying a participatory systems dynamics model, whereby "model users can test various assumptions and explore future scenarios generated by the relationships between housing, energy and wellbeing," Eker et al. (2018, p. 739), find that pure incentives to retrofit old housing stock with energy efficiency measures yield lesser positive wellbeing effects when taken alone than when combined with other improvements, such as access to communal spaces. Thatcher and Milner (2014) find that green buildings are associated with higher productivity and employee satisfaction and lead to improved air quality for residents.

Size and type.



State-led housing projects typically incorporate strict area requirements. The reasons for these size requirements are rarely made explicit, however. Minimum size requirements presumably respond to the need to avoid overcrowding, which, research overwhelmingly shows, can have significant adverse effects, particularly on children. Overcrowding has been linked to higher rates of disease, behavioral issues, and poor cognitive development in children (Myers et al. 1996; Evans et al. 2001; Krieger and Higgins 2002; Guite et al. 2006; Streimikiene 2015). More recently, overcrowding has been associated with higher rates of contagion of the COVID-19 virus (Flint 2020). However, the literature does not specify the absolute amount of space recommended. Foye (2017) argues that increases in living space have a weak effect on life satisfaction. King and Ogle (2014) find that large buildings are associated with weaker social relations—a recurrent finding about high-rise housing types.

Regarding housing type (single versus multifamily housing), Oda et al. (1989) find that among families living in high-rise areas in Tokyo, Japan, children living in taller buildings show delays in independent daily customs (such as greeting and urination) compared to those living in lower-rise units; this is attributed to reduced opportunities for parents and children to socialize. Evans et al. (2003) present various research examples that show living in high-rise, multifamily dwellings can negatively affect preschool children, possibly because of the “social isolation of mothers and inadequate play opportunities for children” (p. 495).

Incremental housing merits some discussion, given its prevalence as a strategy for national and local governments to provide affordable housing. Most research on this topic is qualitative and focuses broadly on understanding how incremental housing takes place in practice, primarily through specific case studies and critical policy and program analyses (Turner 1976; Parra 2007; Garland 2013; Cancellieri 2017). There is general agreement that incremental strategies can allow for a more efficient use of state resources and avoid an otherwise regressive use of housing subsidies, contribute to better urban growth patterns, and, above all, accommodate the evolving social and economic aspirations of low-income households (Buckley and Kalarickal 2006; Wakely and Riley 2011; Murray and Clapham 2015; Acioly 2017; Office of Evaluation and Oversight (OVE) 2017; Adler and Vera 2018). More empirical research on the links between incremental housing and wellbeing is necessary.

2.5. Cross-Cutting Themes

Certain design features are present at both the housing scale and the neighborhood scale. Below, we include a brief discussion of walkability, and safety. “Walkability,” which interacts closely with other design features, such as accessibility, has also been the subject of many recent studies; research on the topic lies at the intersection of the planning, health, and transportation literatures. “Safety” is an exception in the design-focused structure of this review: it is not a design feature but rather one of the dimensions of wellbeing studied. However, as an organizing theme, it encapsulates many design features that cut across the scales we discuss in this paper.

Walkability.

Walkability intersects with many of the other built-environment characteristics explored as part of this analysis, e.g., it interacts with green space and different measures of accessibility. The impact on individuals’ tendency to walk is arguably easier to research, as it is comparatively easier to quantify. However, our review reveals that the way studies measure walkability goes beyond whether people walk or not and includes aspects such as the perception of ease of walkability and the time spent walking that exceeded 60 minutes.

Built-environment characteristics have been associated with greater physical activity and greater walkability, including the provision of physical opportunities for walking, the presence of green space, accessibility, and design. Several studies show that the presence of sidewalks and a walkable community design are highly correlated with walking (Gómez et al. 2010; Stevens and Brown 2011). This includes access to green space, which was explored in the previous section; green space is associated with higher rates of physical activity, including walking (Giles-Corti and Donovan 2002; Ellaway et al. 2005). In European cities, greater safety has also been connected to higher rates of walking (Foster et al. 2004; Shenassa et al. 2006).

Mixed use and accessibility are other strong predictors of walkability. Individuals in Belgium who perceived themselves to be closer to areas of activity were more likely to be active (Bourdeaudhuij et al. 2003). A study of elderly populations in Bogotá, Colombia, finds that greater connectivity is associated with higher, sustained rates of walking (Gómez et al. 2010). Some studies find that busy streets are associated with greater walkability (Brownson et al. 2001), while others find that traffic is inversely correlated with walking (Nagel et al. 2008; Gallimore et al. 2011).

A study employing novel techniques to measure built environments finds that a number of design-based urban streetscape variables, such as imageability, enclosure, and human scale, are associated with greater walkability (Ewing et al. 2016). Given the emerging nature of measuring different aspects of design and the experience of design, studies of varied geographic contexts find that street patterns and connectivity have a larger impact than design features such as setbacks or the presence of porches do (Wells and Yang 2008, on US cities; Gómez et al. 2010, on Bogotá, Colombia).

Finally, we note that the quality of life is found to be higher in areas that are measured as more walkable (Ala-Mantila et al. 2018) and that individuals living in more walkable areas are found to be more socially engaged (Leyden 2003).

Safety.

Safety is a theme common to many of the studies we compiled, typically showing as a significant factor driving different aspects of wellbeing. Note that this category refers to social and physical safety from crime and violence, as opposed to construction safety. In particular, a majority of the studies approach safety as part of a broader set of factors that affect residential satisfaction. Overall, safety can result from housing conditions or from neighborhood conditions, which is why it is of interest to our review. Studies exploring safety have measured incidents both at the housing scale, such as the rate of domestic violence, and at the neighborhood scale, such as the rate of local vandalism (Sullivan and Kuo 1996; Fujiwara 2013).

Other studies link lower levels of safety—both as perceived and objectively measured—with lower rates of residential and life satisfaction (Blackman et al. 2001; Balestra and Sultan 2013; Ettema and Schekkerman 2016). In a study that includes 12 different countries, Sugiyama et al. (2014) find safety from crime to be one of the most significant factors associated with recreational walking. Bjornstrom and Ralston (2014) find that perceived danger is associated with lower social cohesion, which is tied to aspects of wellbeing studied in the contexts of place and neighborhood.

Still other research investigates the link between safety and psychological wellbeing. Blackman et al. (2001) find that perceived community safety is significant in determining mental health problems, while Guite et al. (2006) find that the fear of crime is one of the most important factors affecting psychological wellbeing.

2.6. Conclusions

Drawing from more than 200 sources in diverse disciplines, from urban and transportation planning to public health and environmental psychology, we provide a summary of research on the link between housing design and wellbeing. Overall, we find that housing design—the planned architectural, engineering, and site-planning features present at both the housing unit and the neighborhood scales—can yield positive benefits for wellbeing. This finding holds despite the difficulties associated with the study of wellbeing, a concept that can include an extensive list of objective and subjective elements, and whose measurement often responds to researchers’ disciplinary and methodological preferences (e.g., the subjective wellbeing tradition from psychology, the economics-based tradition of “utility” estimation, or studies of community quality-of-life and social fabric). In any case, we note that international agencies such as the WHO and the OECD offer “consensus” indices of wellbeing (Section 2.2) that serve as an entry point for practitioners and future research.

More specifically, we find that the positive design-wellbeing link is most evident at the housing-unit scale (Section 2.4.), which includes research focused on aspects of design that are comparatively easier to measure, such as thermal and ventilation features, and specific aspects of wellbeing, particularly respiratory and mental health. However, as we move beyond the basic features of individual housing units toward larger spatial scales, the link becomes more difficult to ascertain. In addition to the challenges inherent in the study of wellbeing, this difficulty is due to at least two factors.

First, isolating the causality between “place” and outcomes is especially challenging. Qualitative approaches can hint at specific links—say, the relative importance of green space for residential satisfaction—while experimental studies can typically only suggest correlations between place and outcomes. Researchers still struggle to understand which design characteristics matter most, to whom they are most important, and for which outcomes. This explains why the literature exhibits such a wide range of methodological approaches and tools, from the more common use of subjective wellbeing surveys as a proxy for observable measures (particularly life satisfaction, residential satisfaction, and happiness), to the deployment of innovative tools, such as the participatory and interactive modeling of housing interventions. Overall, we believe these theoretical and methodological challenges present a fertile ground for future research, particularly on topics that over the last two decades⁶ have become part of urban planning orthodoxy and that would benefit from empirical research, such as the wellbeing impacts of mixed-use zoning and density.

6. Consider the diagnostic reports and final agreements from the three occurrences of the United Nations Conference on Sustainable Urban Development, known as the Habitat Conferences, held first in 1976, then in 1996, and, more recently, in 2016. These documents show a remarkable evolution regarding the role of cities and housing in the achievement of broader sustainable development goals. Whereas, in the 1970s, the Habitat agreements called primarily for an end to slums and urban poverty, by 2016, Habitat’s recommendations covered not only informality but also social and spatial segregation, the need for compact and mixed-used cities, climate-ready housing and infrastructure, and inclusive planning, among many other topics.

A second factor that complicates the study of the design-wellbeing link, particularly at the neighborhood scale, is how researchers approach the concept of “place.” Physical and environmental factors, by themselves and unilaterally, rarely determine outcomes. Geographic proximity to the bundle of services that housing theoretically provides is not sufficient to guarantee participation in these benefits. Rather, a variety of sociodemographic characteristics, as well as political and cultural factors (including discrimination against indigenous peoples, Afro-descendants, and at-risk migrants), result in contrastingly different experiences across diverse communities. Prescriptions about architectural or engineering design features would not be sufficient to address disparate negative outcomes. We believe this second factor also calls for the introduction of new theoretical and methodological approaches that properly account for the dynamic interactions between place and people.

In addition to these findings, we note that there is a dearth of empirical studies that focus specifically on cases from LAC, and, more broadly, from developing countries. This responds to multiple factors, from data gaps in the coverage and periodicity of objective wellbeing measures (typically gathered in census rounds and household surveys), to the challenges inherent in pervasive conditions of informality (e.g., a lack of baseline data, difficulties in carrying out primary research, and limited representation in academic studies). We find that a majority of LAC-focused studies are thus qualitative in nature and that empirical studies are often included as part of impact evaluation reports, commissioned by funders and state sponsors. There is a tremendous opportunity for LAC-focused researchers to contribute to our topic, as well as a need to identify specific research gaps by looking at whether, and how, previous projects have conceived of the design-wellbeing link, as shown in the next section.



3 — Critical Assessment of Inter-American Development Bank Operations

This section presents a systematic assessment of IDB-funded social housing projects. Our inquiry focused on how projects, in their conception and implementation, incorporated physical design elements, as well as how these were seen to contribute to wellbeing—or, rather, “quality of life,” a more commonly cited impact in IDB programs, which reflects the institution’s official motto (“Improving lives”).

The IDB has approved over 5,500 loan operations since 1961, the year it was founded. Given the difficulty in finding documents for decades-old projects, we narrowed our search to a recent ten-year period, 2009–2019. After applying this first filter, we narrowed our search to approximately 1,600 operations. We then gathered information on all projects led by the IDB’s Housing and Urban Development Division, who typically lead housing operations, and selected those projects whose objectives, components, and results frameworks explicitly included a housing focus.⁷ In addition, we searched for housing-focused loans approved by other IDB teams, including those led by the Bank’s private sector arm. This exercise yielded 40 operations, 26 from the IDB’s public sector and 14 from the private sector. We faced limited access to data and considerable information gaps for private sector operations, however, and thus centered our analysis solely on programs led by the IDB’s public sector.⁸ Note, also, that we identified but ultimately excluded an additional 10 operations that focused on housing finance but lacked specific objectives, components, or any other prescriptions regarding housing construction. Appendix A shows a list of operations analyzed as well as those that were excluded from the analysis.

From a final sample of 26 projects, we gathered and analyzed the following document types: Loan Proposal; Evaluation and Monitoring Arrangements; Project Monitoring Reports; Economic Analyses, and Environmental and Social Analyses. When available, we also analyzed other supplementary documents that are commonly included as part of the Bank’s loan approval and execution process: Operational Regulations manuals; Project Completion Reports; Sector diagnostics, and Technical Guidelines.⁹ We summarize our analytical approach and findings below.

7. Neighborhood Upgrading operations were included in the assessment only in cases where planned interventions included the construction of housing units. The resulting group of operations in the assessment mostly belong to the Housing and Urban Development Division at IDB (21) but also include two operations from the former division of Fiscal Management (FMM) and one operation from Connectivity, Markets and Finance (CMF), as well as one operation from Opportunities for the Majority initiative (OMJ), and one from the Transport Division (TSP).

8. Access to IDB Invest and IDB Lab databases is restricted; furthermore, operations that are closed cease to show information in the database, which further limited the access to relevant projects in the past. For 14 operations, it was possible to review a) Project profile; b) Preliminary loan proposal; c) Annual Supervision Report; and d) Loan contract. These documents have scant information on the design and eligibility criteria for housing solutions. The main insight stemming from these operations is that private sector solutions tend to support a local institution for delivering financial solutions, such as micro loans, in contexts of housing deficit. Third party partners are selected based on their expertise in delivering housing for the poor, and therefore technical requirements regarding housing construction and design are not as relevant than factors such as the borrower’s financial and institutional stability and historic track record.

9. Note that the analysis did not include local standards that might have been part of implemented projects but that were not explicitly mentioned in IDB project documents. This absence was assumed to indicate that design standards were not central to the intended objectives.



3.1. Links between Physically Mediated Qualities of Housing and Wellbeing

The assessment identified at least 27 distinct housing design features that were expected to positively contribute to beneficiaries' wellbeing (see Table 1). These attributes were expressed either as stated objectives (e.g., "to increase thermal comfort attained by the beneficiaries on account of the characteristics of the new homes"), results indicators ("number of units with an increase in the level of comfort"), or explicit parametric requirements (e.g., "housing must not surpass 25°C for more than 60% of the year in dry climates"). The latter type of mention was less frequent and, when present, was part of the beneficiary eligibility criteria.



Table 1 — List of design features and their links to wellbeing present in the IDB operations analyzed

Links between physical design elements and wellbeing / quality of life goals in IDB operations		n=26 Instances of elements found in operations as:			Examples
		Stated objective	Results indicator	Parametric requirement	
	Elements/works to provide access to basic and social services (water, electricity)	21/26	26/26	0/26	Access to drinking water; works for urban and social amenities built/improved
	Locations/works to reduce physical risks	17/26	7/26	2/26	Households protected from flood risk; lots with water table >50 cm below surface, and on grades of less than 40%
	Physical elements to reduce qualitative deficit : quality of materials and/or finishes	14/26	10/26	0/26	Housing units with walls, roof and floors built of solid and environmentally sustainable materials
	Housing/works to increase property value	7/26	13/26	0/26	Land value after works; Increase in property value
	Housing/works to increase flexibility of unit	6/26	0/26	0/26	Incremental design that is feasible in the truly lowest income deciles; unit must have the capacity to expand
	Planning/works to increase public and green spaces	6/26	6/26	0/26	Number of green areas upgraded; % of homes that report using public spaces
	Housing solutions to improve environmental quality	6/26	6/26	0/26	Reductions in water and energy consumption; GHG emissions mitigated
	Housing/works to avoid overcrowding	6/26	5/26	5/26	Reduction of dwellings with over 3 people per room for sleeping; must comply with min. 48m ² per unit
	Process to achieve participatory design	5/26	0/26	0/26	Housing prototypes will be designed with community input
	Solutions to achieve thermal comfort in the housing unit	4/26	1/26	3/26	Increase in the level of comfort; the unit will observe architectural criteria adapted to the bioclimatic zone
	Physical elements (amenities) to build social capital	4/26	0/26	0/26	Foster urban integration by providing basic infrastructure, social and urban services to enhance social capital

n=26
Instances of elements found in operations as:

Links between physical design elements and wellbeing / quality of life goals in IDB operations

	Stated objective	Results indicator	Parametric requirement	Examples
 Physical elements to improve street design	5/26	0/26	0/26	Provide or rehabilitate street furniture and equipment
 Physical elements to improve health	4/26	2/26	0/26	Presence of Acute Diarrheal Disease; Tuberculosis per 10,000 inhabitants
 Improve location of the housing solution	4/26	2/26	0/26	% of people living in city center
 Environmental features to provide safety against crime	3/26	0/26	0/26	Finishes should have elements of security; unit should comply with the characteristics of security, privacy
 Physical elements to make unit culturally appropriate	4/26	0/26	0/26	Develop house construction technology appropriate to local conditions
 Physical elements to make housing functional	4/26	0/26	0/26	Must have kitchen area separate from bedrooms; must include a multiuse area
 Physical elements to make housing accessible	3/26	0/26	4/26	Universally accessible home; units to be occupied by PWD must comply with accessibility norms by CONADIS
 Physical elements to reduce household expenses	2/26	2/26	0/26	Change in HH expenses in electricity; Savings on water and electricity bills
 Urban planning to achieve mixed income neighborhoods	2/26	0/26	0/26	Promotion of mixed-income and affordable housing will be actively pursued
 Result: improvement in satisfaction	0/26	2/26	0/26	HH that consider the neighborhood a good place to live
 Result: improvement in local development index	0/26	2/26	0/26	Reduction in Unmet Basic Needs Index; Score on the Social Register and Multidimensional Poverty Index
 Result: permanence , occupation after intervention is over	0/26	4/26	0/26	% of HH live in the program dwellings after six months/ that remain in new settlements 18 months after relocation

Note: Only features that are in some way mediated by physical design were considered in the analysis (e.g., tenure security and increase in household income were not considered as a link between physical design and wellbeing). The table does not show design elements found infrequently but that are worth noting: privacy, ventilation, ease of maintenance, innovation in design, reduced vehicle speed, and increased number of bicycle trips.

The results of this initial assessment reveal the group of physically mediated qualities that tend to be most frequent in prescriptive statements on how to deliver wellbeing in housing interventions, i.e., those that guarantee access to basic and social services, reduce physical risks, and/or increase property values.¹⁰ Interestingly, other elements that tend to be more conventionally linked with “design” are less frequently mentioned and typically refer to overcrowding, the quality of construction materials, flexibility, and access to public and/or green space.

This analysis also documents that a little more than one-third of operations (36%) use impact indicators to quantify the effects of housing/built environment on wellbeing.¹¹ From these, 44% use objective measures (e.g., incidence of diarrhea, morbidity, thermal comfort, improved household income, visits to the doctor, etc.); and 56% use subjective measures (perception of the quality of life, perception of the living situation, self-reported satisfaction). The rest—64% of total—only use outcome-level proxies (e.g., improved local development index, improved quality of construction, increase in property value, GHG mitigation, etc.).

10. An increase in property value is often used in an operation’s cost-benefit analysis and is expected as an outcome of the intervention, as it is by far the most common proxy to measure improvements in a beneficiary’s life. This follows an economic argument that links wealth to happiness (see Ruprah (2010, p2): “homeownership causes increased happiness ... the accumulation of wealth represented by the net value of house may increase life satisfaction of homeowners”).

11. These indicators refer to a quantifiable aspect that can be considered to directly determine a person’s quality of life, such as those related to the health of the inhabitants (Eger and Maridal 2015). In contrast, proxies that use outcome-level metrics seek to quantify aspects that may have an impact on wellbeing but require assumptions to establish this connection (e.g., humidity).



3.2. Use of Design Guidelines and Standards

To further examine the level of specificity of the elements related to physical design that are considered in IDB operations, we built a set of six typologies. We used them to classify whether mentions of any of the 27 design features listed in Table 1 pointed toward concrete quantifiable or qualifiable aspects of design of housing solutions or were rather treated as more conceptual objectives. The more specific they were, the more they resembled what we refer to as a “design guideline or standard” (where standards are mandatory and guidelines are not; see City of Spokane and Urbsworks Inc. 2020).

The following guidelines/standards were present in operation documents as links to wellbeing, often by implying that compliance with these elements would be conducive to “adequate,” “habitable,” or “quality” housing solutions.¹²

Type 1: General statements on design objectives. This type of mention includes ambiguous expectations on the housing unit and/or its built environment, e.g., “must have access to services, be risk-free, be habitable.” This means that IDB project documents provide no technical references to quantify or verify compliance. Eight percent of assessed operations have this kind of guideline as the sole stated reference for design.

Type 2: Enumerative (“checklist”). Operations sometimes list a series of specific characteristics/elements the unit should have to be considered acceptable, adequate, etc. For example: “Must have a sanitary block (septic tank, toilet, shower, and a multi-purpose sink), concrete or wood for the outer walls, and floor on concrete slab, basic doors, windows, electrical wiring and water connections.” Over half of the operations (54%) mention this kind of guideline or standard, and only one gives it as its sole stated reference for design.

Type 3: Referential. This standard externalizes specific requirements and recommends that projects consider third-party references. Some examples include: “should take into account access by disabled people when applicable—see guidelines and checklist from Handicap International”; “measures will deliver reductions equivalent to PassivHaus”; “The international standard for individual private space is 14 m² per person for minimum habitability.” These are mentioned in 28% of operations, almost always accompanied by local standards.

Type 4: Local. In this case, design guidelines or requirements are mentioned as part of compliance with national or subnational codes, standards, planning documents, ordinances, etc. These also include cases where housing unit verification must go through on-site evaluation to ensure the quality of construction, as well as instances where consistency with design manuals is expected (e.g., “Street Design Manual for Bolivian Cities 2015”). Half of operations mention this type of guideline or standard, and three instances give this as their sole stated reference for design.

12. For example, the operation for Ecuador’s Social Housing National Program refers to the concept of adequate housing: “A dwelling will be deemed adequate if it is constructed with durable materials, has access to sanitary services, electricity, and sanitation, a floor area of at least 36 m², and secure tenure.”

Type 5: Parametric. References to a quantifiable measure of design elements were considered in this category (i.e., minimum unit dimensions,¹³ slope, distance from amenities, number of openings for ventilation), as well as particular models or finishes for design elements (cement or mortar floor; bricks or better; single-family unit). More than half the operations (54%) mention this type of guideline or standard, and two instances give this as their sole stated reference for design.

Type 6: Prototypical. Some operations use a typology of housing (existing or new) to guarantee that certain design characteristics are met. For example, Brazil's Urban Upgrading and Social Inclusion Program considers four housing typologies with preestablished dimensions and number of rooms; the typology is selected based on the number of household members. Basic modules for progressive housing with preestablished dimensions¹⁴ and a performance-based selection of housing solutions¹⁵ are included in this category, as well. One in every four operations consider this type of design guideline or standard.

Finally, it can be noted that 50% of operations have three or more of these different types of design standards and guidelines. 36% of them include parametric and enumerative standards, which could suggest that design was more robustly incorporated in operation planning documents.

13. Minimum dimensions ranged from 36 m² per unit in Nicaragua, to 72 m² per unit in Ecuador; this is not only a context-specific standard, but also is associated with the level of income targeted in the operations.

14. For example, Nicaragua's Housing and Comprehensive Habitat Improvement Program includes this solution for beneficiaries with less than 2.5 minimum wages; the constructed area must fall between 21 and 36 m² and include a multiple-use area and a humid nucleus.

15. To deliver targeted GHG reductions for each housing unit, the Ecocasa operation in Mexico allowed for a flexible combination of available measures: insulation of roof and walls, reflective paint, efficient gas boiler/refrigerator, solar water heater, and energy-saving windows.

3.3. Best Practices

Three operations are noteworthy for their active consideration of design in the project's conception and implementation overall.

The Ecuador project, approved in 2019 as the “first individual operation under the CCLIP Housing Solutions for poor and vulnerable households” (EC-L1245), had the goal of “improving access to affordable, sustainable, and universally accessible housing.” To achieve this, operational guidelines mandated the application of universal-access criteria, the observation of architectural criteria adapted to the bioclimatic zone, and impact metrics that included savings on water and electricity bills and energy savings incorporated into the construction materials. Furthermore, impact indicators sought to measure direct effects on wellbeing, such as the presence of acute diarrheal disease (ADD), and the time spent on unpaid work by the head of household. A second and related example was the National Program for Social Housing Infrastructure in Ecuador, the only operation that considered both objective and subjective measures of wellbeing (morbidity levels and the perception of quality of life in program beneficiaries).

In the context of this review, Guyana's Sustainable Housing for the Hinterland (GY-L1028), which sought to improve housing conditions (improved unit structure, materials, and space, as well as sanitation and access to water) for Amerindian communities in Guyana, stands out for two reasons. First, the operation incorporated specific design prescriptions that were originally developed in active cooperation with participating indigenous communities—the first time this was attempted by Guyana's housing authorities and a rare approach for most multilateral development banks.¹⁶ Second, these original designs were improved upon during implementation, based on feedback from beneficiaries, who, among other issues, thought that ventilation and temperatures could be improved. While the loan's results framework only focused on measurable improvements to access to services and reduced overcrowding, it also included an indicator for women's empowerment, based on increased women's participation in the design and beneficiary selection processes required by the operation.

16. For a qualitative assessment of this project's participatory process, written by one of the architects who participated in the project, see Arboleda (2020).

Nicaragua’s “Housing and Comprehensive Habitat Improvement Program” also stands out as a housing intervention that had clear impact-level design contributions to wellbeing (the percentage of families that live in good quality housing: with walls, roofs, and floors built of solid and environmentally sustainable materials and all public services installed and working). The program’s operational regulations are particularly specific about design-related quality controls that must be applied to achieve good-quality housing (no leaks; reinforced structures) and materials (nonhazardous, locally appropriate, and sustainably-sourced; cannot be eaten by insects; lab-tested, etc.).

The level of prescriptiveness in project design that a multilateral development bank such as the IDB should have in local housing projects merits further discussion. Nonetheless, in contexts where local regulations may have gaps or issues of implementation/compliance, such specific detail on design elements for an operation’s eligibility criteria and verification processes may be warranted. Some of the completion reports for these operations also suggest that more standardized parameters—e.g., quality control of the materials—could even lead to lower interest rates, which would contribute to effectiveness.¹⁷

17. “Trinidad and Tobago—Housing Finance Mechanisms for Lower Income Households” (TT-L1016). This Neighborhood Upgrading Program expected that standardizing certain design parameters, such as building plans, quality control of materials used, and financial planning, could lead to indemnity schemes and lower effective interest rates for these loans.



3.4. Results and Discussion

Considering all the references to design-wellbeing links and the types of design guidelines in project documents, we conclude that approximately 30% of the housing operations in our review included specific and quantifiable elements of housing design. Most operations (57%), however, were guided by a set of design principles that may or may not be echoed in local regulations. The remaining operations (13%) addressed design in only a marginal way.

In this regard, the results suggest some disconnection between design objectives during the planning stages, and their operationalization and monitoring during execution. This is particularly relevant when examining some of the higher-tier design objectives found in the literature review (e.g., street design, safety, and cultural appropriateness). These objectives are indeed present as aspirational statements in some operations but are not included in the outcome and output indicators. Most are not mentioned in operational guidelines, while others—even when included in the initial results framework—are not present in Project Monitoring Reports. This dilutes their influence in the operation's execution (as far as documentation is concerned).¹⁸

A working hypothesis is that these physical design objectives are less important to the lowest-income households than are more pressing issues, such as the security of property titles and access to finance, which are typically more closely associated with economic outcomes and thus tend to be at the core of the intervention's rationale. Also, particularly in the case of complex outcome-level metrics such as walkability, social capital, and use of public space, there is a time-lag until significant impacts become measurable “on site,” which may reduce the ability of practitioners to include them in results frameworks and impact evaluations.¹⁹ Finally, it is important to consider that the enforcement of design parameters and guidelines demands institutional capacity. This may put a strain on already scarce institutional capacities in most contexts where the IDB intervenes. For this reason, if design is to be more forcefully mainstreamed in housing operations, indicators and standards should aim to be specific but also simple to monitor, harnessing technology as much as possible.²⁰

Beyond these challenges for future operations, the assessment also conveys the increasingly diverse design elements the IDB uses to shape housing solutions. Aspects such as the role of green space, public space, and central location in delivering quality housing, have become much more prevalent since 2015.

18. Note that no interviews were performed for this rapid assessment, which is a limitation of the study. Another limitation is that PCRs do not focus on all of the outcomes of results frameworks, and impact evaluations were only found for one of the operations reviewed (EC-L1113).

19. The only impact evaluation found for any of the operations reviewed (EC-L1113) attempted to measure the effects on housing deficit (quality of materials, access to basic services, and overcrowding) and changes in socioeconomic characteristics (household income). The only two variables with significant results were overcrowding and electricity, which may arguably be some of the most immediate and easily measured results. Access to functioning basic services, particularly in rural areas, often will take time beyond the operation's timeline, and the impacts on income—if they exist—will also take time to materialize.

20. For example, future stages of PROMEBA in Argentina will use high-frequency surveys to capture real-time big data in the communities intervened in.

Furthermore, the broad range of physical elements found to be potentially associated to the quality of life in these operations suggests that, just as in the literature review, there is little consensus on how particular design aspects contribute most to wellbeing. The exception is the frequent use of “property value” as a standard metric of the cost-benefit analysis in housing operations. While this metric may be easier to analyze, it may lead programs to prioritize design aspects that could result in an increase in property values (size, materials, number of rooms, pavement, and single-family units).

Other insights that are a product of the joint analysis of the literature review and the housing operations assessment, and which can provide a way forward for IDB program design, include:

- Objective and subjective measures of wellbeing. There is no conclusive argument on whether objective or subjective measures of wellbeing are best suited to characterize the impact of housing and built-environment design. Rather, in the literature, they are often seen as complementary (Stiglitz et al. 2009); in IDB operations, they were generally not used simultaneously. However, impact evaluations—which are mostly available for housing operations prior to those included in this analysis—do consistently combine both types of metrics.²¹
- There are certain design-mediated housing outcomes that are conclusively desirable as contributors to wellbeing. Access to green space, a sense of security, ventilation and interior air quality, thermal comfort, and low maintenance costs seem to be both supported by the evidence and their “no-regret” nature. Nonetheless, few of them are consistently being pursued and monitored in IDB housing operations. This may be due, in part, to baseline data unavailability and/or institutional capacities. COVID-19 has made this as relevant as ever, and technological advancements should be explored and harnessed to fill these data and performance gaps.
- The role of multilateral development agencies on local design. This assessment was based on the expectation that the IDB assumed some responsibility and/or accountability to achieve “good design” in the housing units it helps to finance. This assumption is questionable, since good design must almost always be locally grounded.²² But the findings from this assessment suggest that a performance-based approach to design in housing operations may be worth considering. Through a menu of options or complete flexibility for local developers, this ensures the attainment of some critical outcomes that housing design facilitates in people’s lives. In this regard, the approach of Mexico’s Ecocasa project (ME-L1121) is instructive.

21. The Habitat program in Mexico measured access to streets with urban infrastructure, and subjective satisfaction with the physical conditions of the urban environment, which were both the most significant impacts of the program; in Brazil, Favela Bairro measured access to services related to health, travel time to school, and changes in household income as a product of housing, but also measured subjective residential satisfaction. The first phase of PROMEBBA in Argentina measured morbidity and residential satisfaction, as well as the beneficiaries’ stated intention to stay in the new unit.

22. Some Latin American authors suggest that such a stance would presuppose the existence of an “idealized user” (Enciso 2005); rather, users of housing may benefit most from flexible, evolutive, productive and participative solutions (Pérez 2016).

Rapid urbanization, exponential technological change, and the impacts of climate change, as well as the lingering effects of the COVID-19 pandemic on cities around the world, have repositioned housing at the center of both the urban planning and the broader development agenda. In this context, housing can be designed and built to directly enhance the physical, social, and mental conditions most commonly associated with individual and household wellbeing.

The discussion of whether the variety of design elements available can help deliver wellbeing is thus especially relevant. We have presented elements, such as green space and thermal comfort, that have, over time, become more present in IDB operational design. Other critical aspects, such as natural light and interior air quality, are amply discussed in the literature but not widely incorporated in practice. Whether these design elements can be standardized into objective parameters is subject to discussion. Even so, there is sufficient evidence to suggest that minimum design guidelines or requirements should always be used to shape operations toward better outcomes.

To ensure a more comprehensive inclusion of design into operations, entities such as the IDB may need to support more experimental research as part of their impact evaluation practices, while remaining sensitive to the fact that outcomes must be clear and practical to measure. The relative importance of each element, the critical aspects for implementation (i.e., not just any green space, but an easy-to-maintain and accessible green space), and most important, the non-physical conditions that must be met to ensure that design renders its maximum benefits are areas for further exploration.

4 — Appendix A. List of Assessed IDB Housing Operations



IDB Housing Operations Identified Included in the Analysis

Operation Number	Country	Name
AR-L1101	Argentina	Development Program for Metropolitan Areas Outside the Capital
AR-L1260	Argentina	First Operation of the Urban Integration and Social And Educational Inclusion Program
BO-L1079	Bolivia	Urban rearrangement program La Ceja
BR-L1078	Brazil	Urban Upgrading and Social Inclusion Program
BR-L1084	Brazil	Integrated Urban Development and Social Inclusion Program of Aracaju
BR-L1411	Brazil	Urban Upgrade Program in the Western Area of Aracaju—Building for The Future
BR-L1421	Brazil	Integrated Sustainable Urban Development Program of the Municipality of João Pessoa
CO-L1125	Colombia	Program for Support of Sustainable Development in the Department of the Archipi
CO-L1155	Colombia	Second Operation Under the Multisector Conditional Credit Line for Investment Projects
DR-L1084	Dominican Republic	Comprehensive Tourism Urban Development Program for Colonial City of Santo Domingo
EC-L1074	Ecuador	National Program for Social Housing Infrastructure
EC-L1099	Ecuador	National Urban Development Program
EC-L1113	Ecuador	Social Housing National Program—Stage 2
EC-L1245	Ecuador	First individual operation under the CCLIP Housing Solutions for poor and vulnerable households
ES-L1022	El Salvador	Housing Program and Integral Improvement of Urban Informal Settlements
GY-L1028	Guyana	Sustainable Housing for the Hinterland
HA-L1048	Haiti	Support for the Shelter Sector Response Plan
ME-L1121	Mexico	CTF-IADB “ECOCASA” Program
NI-L1053	Nicaragua	Housing and Comprehensive Habitat Improvement Program
PE-L1096	Peru	CMAC Ica-Capital Strengthening and Low-Income Housing Program
PR-L1082	Paraguay	Improvement of Housing and Habitat
PR-L1152	Paraguay	Housing and Rehabilitation Program for Bañado Sur in Asunción
SU-L1015	Suriname	Second Low-Income Shelter Program
SU-L1046	Suriname	Paramaribo Urban Rehabilitation Program
TT-L1016	Trinidad and Tobago	Neighborhood Upgrading Program
UR-L1146	Uruguay	Neighborhood Improvement Program III



IDB Housing Operations Identified but Excluded from Analysis

Operation Number	Country	Name
BO-L1135	Bolivia	Financial Services for Social Housing in Rural Communities
CR-L1072	Costa Rica	Coopenae Housing Financing Partnership
CR-L1073	Costa Rica	MUCAP- Home Improvement Loans for the BOP in Costa Rica
CR-L1080	Costa Rica	Banco Davivienda Costa Rica Green Line Partnership
CR-L1083	Costa Rica	Coopeservidores Housing Financing Partnership
DR-L1060	Dominican Republic	Banco Ademi: Access to Home Improvement Financing for the BOP in DR
ES-L1086	El Salvador	Habitat for Humanity: Increasing Access to Home Improvement Financing for BOP
ES-L1094	El Salvador	Banco Davivienda MSME Financing Partnership
HA-S1008	Haiti	CP-Marigot Development and implementation of financial products for housing
HA-S1009	Haiti	CP:Fraternité- Development and implementation of financial products for housing
HA-S1012	Haiti	CP-Kotelam Development and implementation of financial products for housing
JA-L1070	Jamaica	Financing Water Adaptation in Jamaica's New Housing Sector
ME-L1138	Mexico	FOMEPADE - Increasing Access to Housing for the BoP Public Employees in Mexico
ME-L1179	Mexico	Mexican Capital Markets Mortgage Financing
ME-L1254	Mexico	This House is MIA (MINE): New Affordable Housing Models
ME-L1260	Mexico	Expanding Green Financing and Affordable Housing in Mexico
NI-L1065	Nicaragua	Rent to Own: Innovation to Improve Access to Social Housing in Nicaragua
NI-L1072	Nicaragua	Progressive introduction of basic services and social housing for the BoP-PRODEL
NI-L1053	Nicaragua	Housing and Comprehensive Habitat Improvement Program
PE-L1095	Peru	CMAC Maynas: Capital Strengthening and Low-Income Housing Loan
PE-L1102	Peru	CMAC Sullana
PE-L1142	Peru	Access of the BOP in Peru to Financing and Advisory Services for Incremental
PE-L1161	Peru	Fondo MiVivienda Sustainable Social Housing Partnership
PN-L1102	Panama	Banco General Housing Financing Partnership
PR-L1140	Paraguay	Project for the Development of the Housing Finance Market in Paraguay

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The Relationship between

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