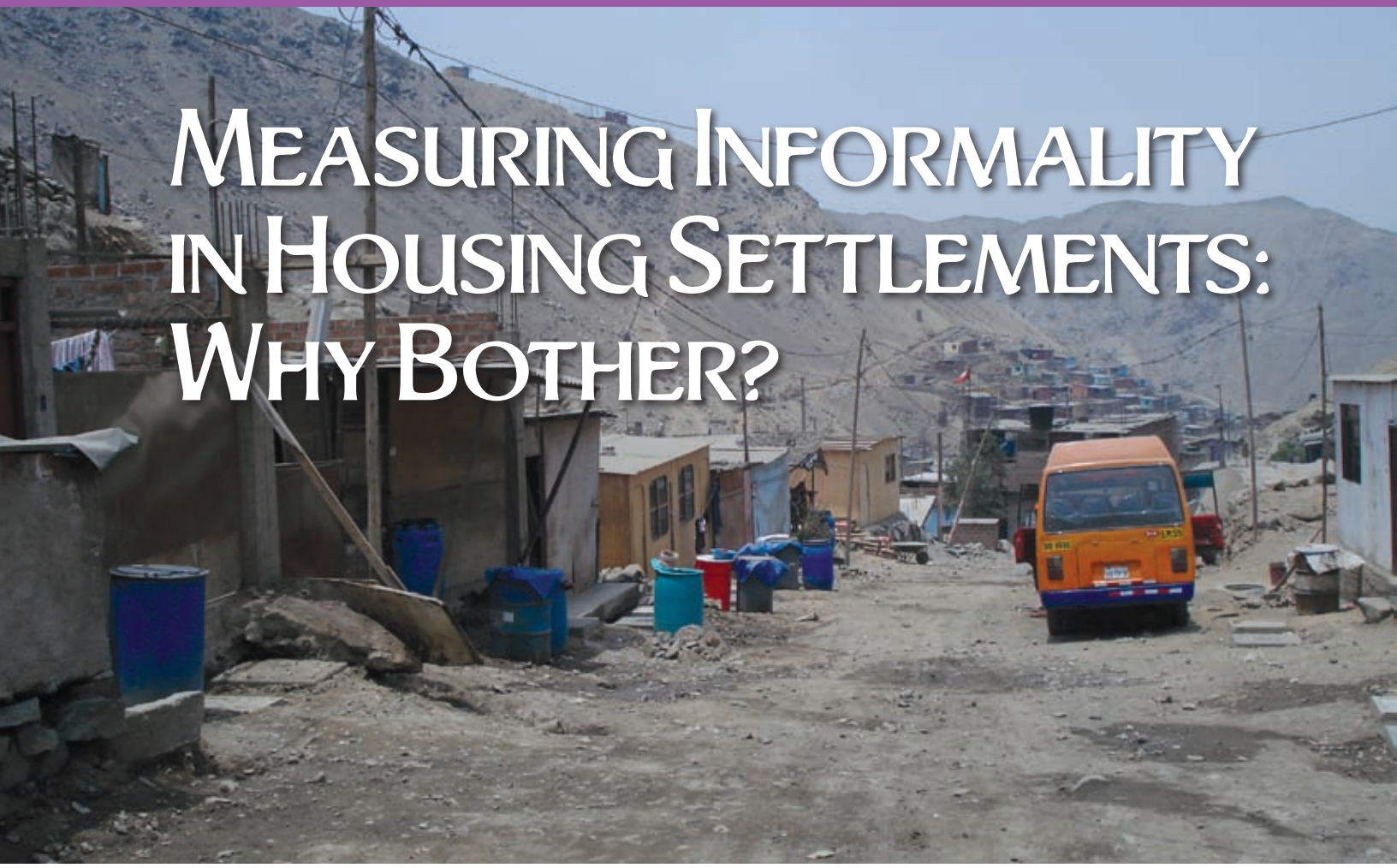
Measuring Informality in Housing Settlements: Why Bother?



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The residents of this informal settlement in the district of San Juan de Lurigancho outside Lima, Peru, have property titles but no access to sewer service.

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Measuring informality in housing is critical for effective policy design and assessment. This article examines operational definitions of housing informality as a measure of physical deficiencies and related lack of compliance to given urban standards (see Biderman, Smolka and Sant'Anna 2008). The first two of the following four proxies for informality are discussed in detail: security of tenure; access to public utilities (water and sewer systems); compliance with urban norms and regulations (plot sizes, street width, and public space); and the physical quality of the housing (building materials).

Existing proxies for informality vary considerably, making it difficult to prepare reliable diagnoses or to evaluate policy performance. The assessed magnitude of informality would be quite small if measured as the percentage of households with no access to electricity or the use of nonpermanent building materials (predominant proxies used in the past), but it would be high if the proxy were lack of connection to a shared sewer network. Furthermore if the proxy indicator were measured by failure to comply with urban norms and regulations, it would not be limited to low-income conditions, but would also include irregular or illegal high-income buildings, or housing where prohibited material such as lead paint is used.

Even within a proxy indicator the measures may vary considerably. For instance, data from the National Institute of Statistics (INDEC) in Buenos Aires indicates that the percentage of households without secure tenure jumps from 1.37 percent if it is defined as households not owning the land they occupy, to 10.19 percent if it is defined as the lack of a title or legal document proving one's tenure security.

Similar discrepancies are found for access to sewer services, when that is defined either strictly as a connection to the public network, or more broadly as a connection to either the public network or a septic tank. According to the Costa Rican Multiple Purposes Household Survey (EHPM) in 2006, 71 percent of households in Costa Rica did not have access to a public sewer

network, but 67 percent had access to a septic tank. Thus, the measure would change from 71 percent to 4 percent depending on the definition. In absolute terms this result is more dramatic for comparisons of countries than for urban areas, because of greater discrepancies in urban versus rural access to services and infrastructure. For example, the percentages for strict versus broad definitions in several cities are 1 and 3 percent for Bogotá; 5 and 10 percent in Mexico DF; and 13 and 16 percent in Lima, respectively.

Assessing Perceptions of Informality

Because of these problems with proxy indicators, those involved with informality are often uninformed about basic measures (levels and changes), so they may disregard or misinterpret them. Furthermore, careful use of existing data can expose flaws in conventional wisdom regarding informality and the proper policies to handle it. Our study seeks to gauge the perceptions of public officials, practitioners, scholars, and other experts on the nature, magnitude, and trends in informality, and to evaluate the implications of these perceptions for designing and assessing public policies.

To analyze the perceptions and awareness of a cross-section of experts regarding alternative proxies, we prepared a survey that was sent to land policy colleagues in 18 Latin American and Caribbean countries (see page 18). The results indicate considerable confusion about the phenomenon of informality in housing. More than 52 percent of respondents could not easily provide statistics on informality. Although the questionnaire stated that leaving these fields blank would be interpreted as lack of familiarity or uneasiness with the data, many respondents filled in all other sections of the questionnaire except those requesting quantitative assessments. Furthermore, the multiple answers from which they could choose ranged in 5 percent intervals (e.g., 10 to 15 percent) so respondents had some latitude in their answers.

For each proxy indicator respondents were also asked to choose among alternative definitions, the information source, and the year of reference. To evaluate the quality of these assessments, we also collected the most recent information available from the national statistics department Web sites by country and city that would match as closely as possible the definition for each proxy. The obtained percentages are taken as "benchmarks" that vary according to the definition, proxy, and region.

We focused on three proxies (lack of tenure, lack of access to water, and lack of access to sewer service) for the countries and cities for which we had at least five respondents. Despite data limitations we were able to match 504 observations from the survey with these benchmarks (see table 1). Only 22 percent of all respondents were able to match statistics for these three factors to the same range as the benchmark source. The percentage of overestimates may be even higher that shown, since many respondents provided more recent reference dates than the benchmarks (three years on average).

Figures 1 and 2 show that overestimates for security of tenure by country and city were consistently higher than the benchmarks compared to the results for access to sewer service. The lower level of overestimates for access to sewer and water than for the security of tenure in table 1 may be related to their more straightforward definitions, and better evidence of improvements in water and sewer provision than in tenure security. Viewed another way, for every assessment of worsening conditions in tenure there were only 1.2 assessments of improvement, whereas for access to water and sewer services the ratios were 9.1 and 3.1 respectively. Even more important than the

TABLE 1
Comparisons of Survey Respondent Assessments to Official Public Data (Benchmarks)

	Tenure		Water		Sewer		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Overestimate	111	80	73	40	68	37	252	50
Underestimate	11	8	55	30	77	42	143	28
Match	16	12	54	30	39	21	109	22
Total	138	100	182	100	184	100	504	100

over-estimating bias is the low level of precision in the responses—30 percent or less for all three proxies. That is, a significant number of respondents could not match the benchmark even on the proxies of access to water and sewer systems.

In addition to a lack of precision in their estimates, respondents demonstrated great variance in their individual responses when compared to benchmarks. This is striking, considering that one would expect some degree of convergence for indices that should reflect public information. Coincidence among respondents was found to be shared by only 20 to 40 percent of respondents, depending on the definition considered for each proxy.

FIGURE 1
Comparison of Survey Results and Benchmarks on Access to Security of Tenure

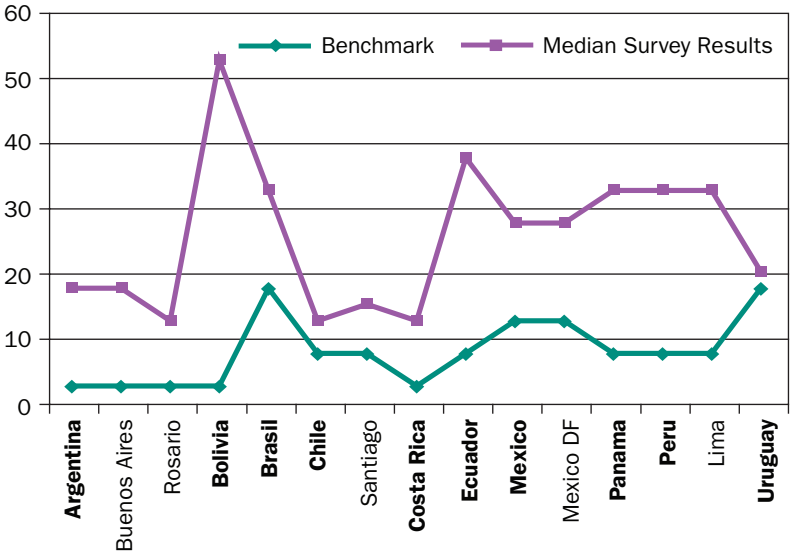
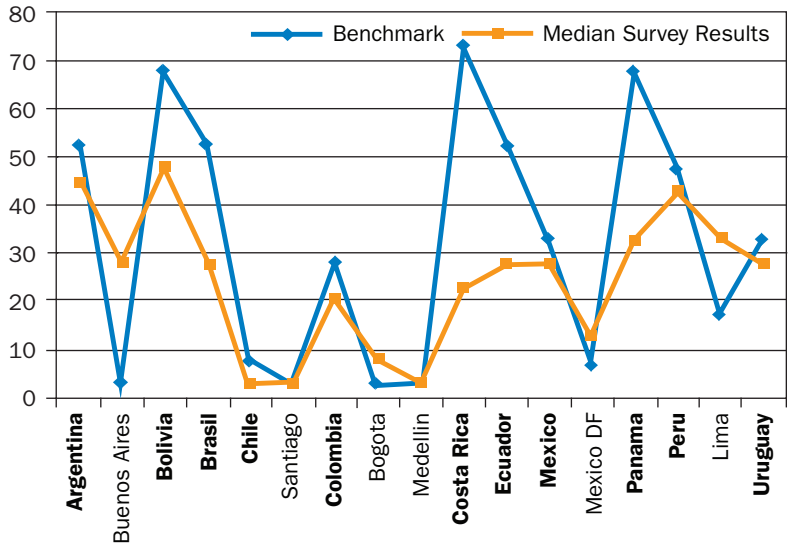


FIGURE 2
Comparison of Survey Results and Benchmarks on Access to Sewer Service



This apparent lack of consensus is also reflected in respondent evaluations of the most relevant proxy for housing informality in their own country or city. Respondents were asked to rank five proxies —security of tenure, access to water, access to sewer service, compliance with urban norms, and building construction—from 1 (low) to 5 (high) according to their relevance. If one proxy was consistently preferred by respondents, a high percentage of responses would appear in ranks 5 or 4; if the proxy was systematically rejected, the higher percentage would be in ranks 1 or 2. The actual result was an almost neutral distribution of preferences, with three out of five proxies (water, sewer and construction) showing a nearly inverted U-shaped distribution concentrated in the medium ranks 2–4 (see figure 3).

This result did not change significantly for countries or cities. Security of tenure was the most controversial, showing a wider distribution from low to high rankings in its upright U-shape. Compliance with norms was the factor most consistently rejected, as shown in its declining slope from low to high ranks. However, more respondents ranked norms than sewer or water service as the preferred alternative (rank 5). This lack of consensus on the relevant proxy indicator affects the degree of agreement on how to treat the problem, and jeopardizes attempts to compare levels of informality and policy performance across countries or cities.

Survey respondents were also asked to provide information on their assessment on the five proxies over time. Those who did so indicated overwhelmingly that conditions are improving, although they diverged again on the relative speed of change for each proxy. For any one perception of a worsening index there were more than two suggesting an improvement on all proxies, and this result is sustained across countries and cities. These figures contrast with the general rhetoric in the region of "worsening of housing settlement conditions," "the lost decade in infrastructure investment," and the like.

Dangers of Reliance on a Single Proxy

One should not jump to the easy conclusion that if all proxy indicators are improving then they must be strongly correlated. This view is implicit,

for example, in the thesis that improvements in tenure security would inexorably transfer to other improvements (de Soto 2000). Table 2 illustrates diverse rates of change in security of tenure and access to sewer systems for a sample of 3,500 Brazilian municipalities from 1991 to 2000, classified in quintiles. Quintile 1 includes the municipalities that have reduced the percentage of untenured or unserviced households the most, while quintile 5 represents municipalities with the worst performance on both measures. Crossing both sets of cases, there are 106 municipalities experimenting with the largest reduction in untenured households (row 1), but also the worst performance on access to sewer service (column 5).

If there were no correlation among changes in these the two proxies, the expected number of cases in each cell would have been 140 (3,500 municipalities divided equally among 25 cells). Exact correlations of improvements in these two proxies would yield diagonal cells with 700 municipalities in each (3,500 divided into 5 cells), and all other cells would be zero. However, observing the number of municipalities in the upper right cell (106) and in the lower left cell (117), we can see that in many municipalities a relatively high improvement in titling was accompanied by a relative high deterioration in access to sewer service, and vice versa. Only 185 municipalities show a high level of progress on both proxies, while 172 show poor progress on both. The overall correlation coefficient between the rate of change in security of tenure and in access to sewer service among municipalities is no higher than 5 percent.

This analysis illustrates the dangers of using one single proxy for informality. The issue is not purely statistical, since improvements in one proxy may indeed induce either deterioration or improvement in another. Corzo and Riofrio (2006) argue that granting a large number of individual property titles to plots in Peru meant families no longer needed to occupy their land in order to own it. Consequently they did not have to share any collective action (or establish community bonds) that are usually critical to the demand for and provision of services. In Peru, this phenomenon has led to the so-called "tourist plot" syndrome of absentee beneficiaries of a titled plot, which in turn is largely responsible for sprawl into unserviced areas, as well as generating vacant land inside the settlement that received the titles.

FIGURE 3
Ranking of Five Proxy Indicators for Housing Informality

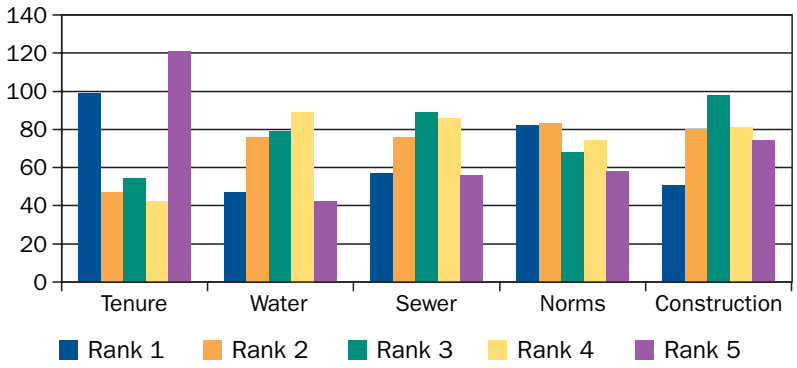


TABLE 2
Distribution of 3,500 Brazilian Municipalities by Rate of Change in Tenure and Access to Sewer Service, 1991 to 2000

		Quintile of Rate of Change				
		1 (low)	2	3	4	5 (high)
		Sewer Service				
Tenure	1	172	166	134	122	106
	2	164	140	140	125	131
	3	123	148	147	146	136
	4	124	131	141	162	142
	5	117	115	138	145	185

Source: Brazilian Census (1991; 2000), Brazilian Institute of Geography and Statistics (IBGE).

Misleading Results from Composite Proxies

In its commendable effort to provide a rough estimate of the number of slums for 316 countries around the world, UN-Habitat (2003) developed an ingenious solution for the lack of consensus on proxy indicators: a composite index of informality attributes. It counts as a "slum household" any group of individuals living under the same roof and lacking either:

- access to improved water: minimum of 20 liters/person/day costing less than 10 percent of household income and requiring less than 1 hour of effort/day; or
- access to improved sanitation facilities: sewage disposal system shared with a reasonable group of people; or
- sufficient living space: fewer than three people per habitable room; or
- structural quality and durability of dwellings: built in a nonhazardous location and protecting its inhabitants from climate extremes; or
- security of tenure: effective protection by the state against arbitrary unlawful evictions.

TABLE 3
Access to Tenure or Sewer Service in Brazilian Municipalities of 100,000 or More Inhabitants

Type	Percent	
	1991	2000
Titled, Serviced, Normal (not slums)	69.4	75.2
Slum Households	30.6	24.8
Untitled, serviced	5.9	8.5
Titled, unserviced	19.4	14.0
Untitled, unserviced	5.4	2.4

Source: Brazilian Census (1991; 2000),Brazilian Institute of Geography and Statistics (IBGE).

This effort to pool data resulted in a rough estimate for the number of slums worldwide. The ubiquitously cited estimate of 1 billion slum dwellers, the expected trend, and its regional distribution drew considerable attention from the media (see Davis 2006). The definition, however, is rather open-ended since countries may define access to services or lack of tenure differently.

Serious shortcomings emerge when, apart from its overall political importance, informality is examined in individual cities or countries for policy assessments and/or space-time comparisons. Misleading interpretations may result, as in this example of two areas (A and B) with 1,000 households each. Households in area A lack only security of tenure, whereas those in area B lack all five proxy indicators. Area B was formed at the same time that area A's tenure problems were resolved through a specific titling program. In principle, the amount of informality has not changed: 1,000 households in area A are no longer counted as slums, whereas a new group of 1,000 households in area B has emerged as a slum settlement. However, overall slum conditions are worse because those in area B lack all five indicators, whereas area A had lacked only four.

Table 3 presents data for tenure and access to sewer service for Brazilian cities of more than 100,000 inhabitants, and clarifies the downside of relying on composite proxies. For this group of cities, using a definition similar to the UN's, the number of households living in slums decreased by just 6 percentage points from about 31 to 25 percent from 1991 to 2000. Using the same data source for the country as a whole (not shown in the table), the share of households living in slums declined 13.6 points from 48.3 percent to 34.7 percent. The latter figures are compatible with the UN's numbers (45.0 and 36.6 percent in 1990 and 2001, respectively). The reduction in slums was largest in the titled, unserviced group, which declined from 19.4 to 14.0 percent.

The untitled, serviced group actually increased its share from 5.9 to 8.5 percent in the 1990s (as did this group in the country as a whole, increasing from 3.6 to 6.5 percent). This dichotomy illustrates that the definition of slums may lead to different

Survey Sample of Latin American Experts

Between January 23 and February 13, 2009, the Lincoln Institute sent an e-mail survey to 6,048 individuals in Latin American who are involved in land policy issues and are part of the Institute's distribution list; 912 surveys were returned.

The Lincoln Institute list includes "thought leaders" in urban planning, including professors, researchers, land policy practitioners (architects, urban planners, economists), and mid- or high- level public officials. More than 70 percent indicated that their professional involvement with informal settlements was either primary or indirect yet regular. Moreover, 36 percent declared that they work directly with regularization or housing programs. The respondents are considered to be representative of above-average qualified professionals involved with public policies regarding informal settlements.

Survey data was analyzed by geographical units (countries or cities) that had a minimum of 10 or 8 respondents, respectively, who had completed at least one assessment field. The following 15 geographic units emerged: 9 countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, México, Perú, and Uruguay) and 6 cities (Buenos Aires, Santiago, Bogotá, Medellin, Mexico DF, and Lima). In addition, the analysis included the countries of Ecuador and Panamá and the city of Rosario, Argentina, which all had at least five observations to compare with available benchmark data.

assessments of the dynamics of the problem. Although the "worse" type of housing (untitled and unserviced) is indeed declining (from 5.4 to 2.4 percent), certain categories of informal groups are actually increasing. By looking at the problem as multidimensional, we can observe changes that cannot be seen using a simplistic dichotomous definition.

For policy evaluation purposes, one can see that a more opportunistic way to show quick results with relatively little expense would be to give titles to the serviced households, thus reducing the number of slums by 8.5 percent in 2000. If the focus shifts to households in the worst conditions (untitled and unserviced) the percentage of slums in 2000 would have improved by only 2.4 percent. Both titled groups had about the same percentage in 1991 (5.9 and 5.4 percent), but Brazil apparently chose the more expensive program of ensuring sewer service irrespective of titles.

Summary and Implications

The survey shows that a significant number of land policy experts in Latin America cannot agree on the correct way to measure the phenomenon of informality and its magnitude, and they are not even familiar with standard official statistics on the issue.

One possible explanation for the apparent lack of knowledge about or access to quantitative information is that most housing policies focus on mitigating particular problems at the project level, rather than developing preventive initiatives that affect the overall process of informality. Clearly the indicators are less important to the former interventions because a project is considered successful when evaluated according to its original blueprint or design (e.g., number of public works executed, number of families assisted). The possible effect of a local project on informality in housing at large is hardly a matter of concern. Why should policy makers bother with city- or country-wide statistics on informality when their primary objective is immediate, tangible results for their own projects?

Another explanation is that many urban planning professionals are architects who are not trained in quantitative methods of analysis. This limited knowledge and interest in proxy indicators is compounded by the lack of quantitative treatment of housing issues in both academic research and official public documents.

Measuring security of tenure and access to services is important in the light of current regularization policies, however. The case of Brazil illustrates how misinformed experts can affect policy priorities. Conditions have clearly improved in access to sewer service, as acknowledged by survey respondents, although they overwhelmingly underestimated the situation and suggested it was better than the level measured in official benchmark data. In contrast, the overestimates for security of tenure indicates the opposite perception, with potentially negative consequences for housing policies. It could be argued that if titling is falling behind the success of service provision, then there should be a stronger titling effort.

The confusing and contradictory responses by Latin America experts who participated in our survey call attention to potentially misleading policies that might be fomented by erroneous perceptions and weak indicators. Will the recent experience of providing services even without titling, together with a massive recognition of titling rights, warrant an even larger reduction in the amount of titled yet unserviced housing, or will it lead to a new wave of informal occupations and further expand the untitled group? Better informed policy officials should answer….

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