



Impact Evaluation

**100,000 Floors to Play On
Dominican Republic**

*Habitat for Humanity Latin America and the
Caribbean, 2024*

Production notes

Publication

This publication was prepared by Habitat for Humanity Latin America and the Caribbean based on an impact evaluation of the 100,000 Floors to Play On initiative in the Dominican Republic. The information provided here was collected between May and October of 2023.

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MONITORING, EVALUATION,
ACCOUNTABILITY AND LEARNING
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Glossary of acronyms

DiD	Difference in Differences estimation
FICEM	Federación Interamericana del Cemento (Inter-American Cement Federation)
HFH	Habitat for Humanity
HFH LAC	Habitat for Humanity Latin America and the Caribbean
MEAL	Monitoring, Evaluation, Accountability and Learning
AO	Area office
ToC	Theory of change



Executive summary

The 100,000 Floors to Play On initiative aims to replace 100,000 dirt floors with concrete in vulnerable households throughout Latin America and the Caribbean between 2022 and 2028. As of July 2023, a total of 2,359 floors have been installed in the Dominican Republic, mainly benefiting families through full subsidies. This pilot evaluation focused on El Seibo and San Cristóbal, where baseline and after-use data on beneficiary families was gathered between May and October of 2023, and comparisons were made.

The purpose of this evaluation is to better understand the impact that installing floors has on economic development, wellbeing, academic attendance, and time spent playing in the home. It also serves to establish a replicable methodology for future measurements. This report is for readers involved in the housing sector, as well as HFH program and advocacy managers and those working to implement the 100,000 Floors to Play On initiative.

To measure impact, we used a difference-in-differences (DiD) methodology consisting of surveys conducted with a beneficiary and a comparison group before having received the improvement and then three to six months after to establish a comparison.

What *does this evaluation measure?*

Economic Development
Perception and self-report about:

- Level of financial resources needed to achieve livelihoods
- Quality of homes
- Home and health investment/expenditures



Well-being

- Satisfaction with the home and floor (contributing directly to self-esteem and the perception of safety)
- Perceived stress



Educational development

- School absenteeism
- Hours of play inside the home



Who/Where *was the target population?*



170 cases of people like Railini:

43 years old, 2 children and caregiver to her mother	Didn't finish primary school	Infomal employee and a monthly income of 170 dolars
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Vulnerable housing conditions including a dirt floor


Vulnerable context






They went through an important **dengue** crisis, **floods**, hurricanes, and, **economic** deprivation specially for women

Main findings



Thanks to a cement floor, vulnerable people living in vulnerable contexts full of shocks and tensions...





...have a better economic development thanks to

- 79%** of savings in health expenditures, 
- 20%** more financial stability to achieve livelihoods 
- leading to **12%** increase in home investment 

...have a better educational environment for their children thanks to

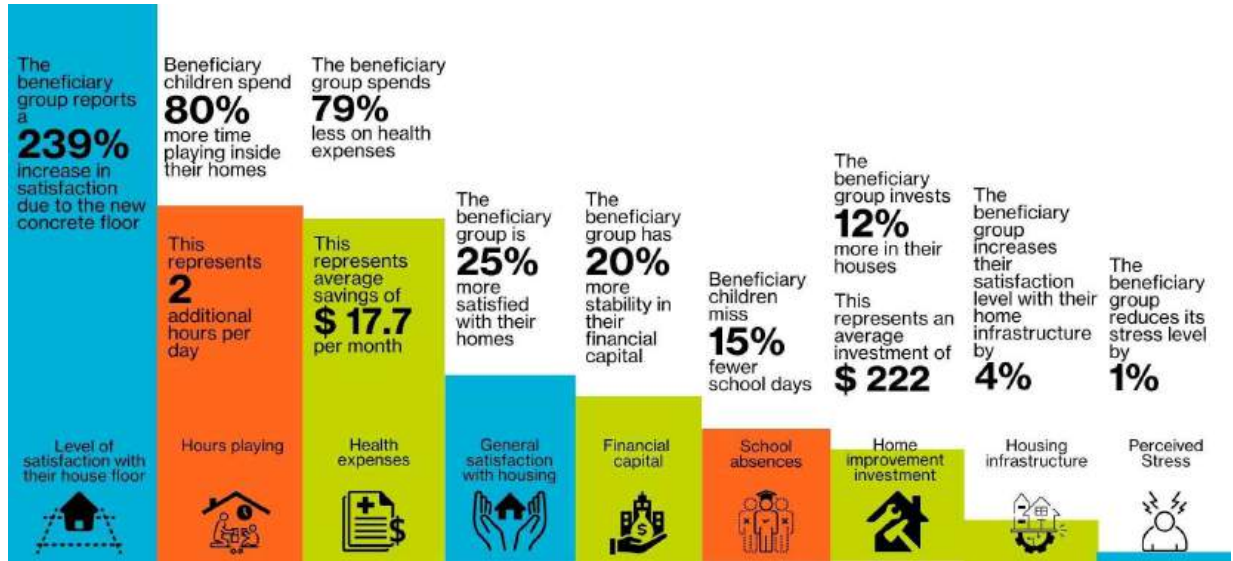
- 80%** more hours of play inside the house and which represents 2 hs per day 
- 15%** less classes missing 

...have better well-being explained by

- 239%** more satisfaction with their floor and 
- 25%** more satisfaction with their home 
- 1%** less stress level

Hours of play is the second most impactful result of having a decent floor

Results per level of impact:



Floor= Resilience

“ This floor was in very bad condition, before having a concrete floor we didn't want to come home, but now I want my family to come home. My son Jake plays ball, he likes to spend more time playing in the floor, he has more freedom at home and does all his homework”

Mayelin

“ Now I feel good about my grandchildren playing on the porch's floor with their toys, where as before they couldn't because they got sick, and there were rats and other animals coming in since there was a space between the floor and the walls”

Ana Berkis



Introduction

The 100,000 Floors to Play On initiative was created by the Habitat for Humanity Latin America and the Caribbean (HFH LAC) area office (AO) in partnership with various civil society, government, and private sector organizations. Its goal is to replace 100,000 dirt floors with concrete over a five-year period (2022–2028). By heavily relying on local actors in each location where it is implemented, the initiative is unlike any other in the region.

As of July 2024, a total of 2,359 concrete floors were installed in the Dominican Republic, thanks to partnerships with public and private entities. For most of these families, the new floor was completely subsidized. This pilot evaluation centers on the communities of El Seibo and San Cristóbal and spans a period from May to October 2023. The community selection process was based on the amount of time the initiative has been active; that is, the communities selected for this study represent the first interventions after the Monitoring, Evaluation, Accountability and Learning (MEAL) plan for the 100,000 Floors initiative was designed.

To conduct the evaluation, we established a baseline measurement for two groups. The first was composed of beneficiary families who would receive a floor, and the second of families who would not receive a floor, which served as a comparison. Between three and six months after the intervention was complete, data was again gathered to establish a before-and-after comparison.

We then used the difference-in-differences (DiD) estimation to create a replicable methodology that would highlight the impact that installing concrete floors can have on economic development, wellbeing, academic attendance and time spent playing in the home.



Description of the initiative

100,000 Floors to Play On is a regional initiative by Habitat for Humanity and the Inter-American Cement Federation (FICEM). Its goal is to replace 100,000 dirt floors between 2022 and 2028 with concrete in vulnerable households across Latin America.

Some 50 million Latin Americans live in homes with a dirt floor. Dirt floors are known sources of infection, notoriously housing parasites, bacteria and insects that can cause diarrhea, respiratory illness, anemia, immune deficiency, malnutrition, Chagas disease, rashes, and other health conditions.

The initiative is geared toward families in the Latin America and the Caribbean region who live in homes with floors that are made of dirt or otherwise in very poor condition. Priority is given to families with women heads of household and those with children under the age of six, older adults, or people with disabilities.

The initiative's Theory of Change (ToC) was established in 2023 with participation from subject-matter experts, and can be summarized as follows:

If...

We install adequate floors in the homes of those who currently have a dirt floor, strengthen their technical skills and level of safety inside the home, and bolster community organization and disaster preparedness...

Then...

They will experience improved housing conditions and fewer disruptions from illness and increase their financial resources, and school-age children will reduce the number of academic absences and increase play time inside the home...

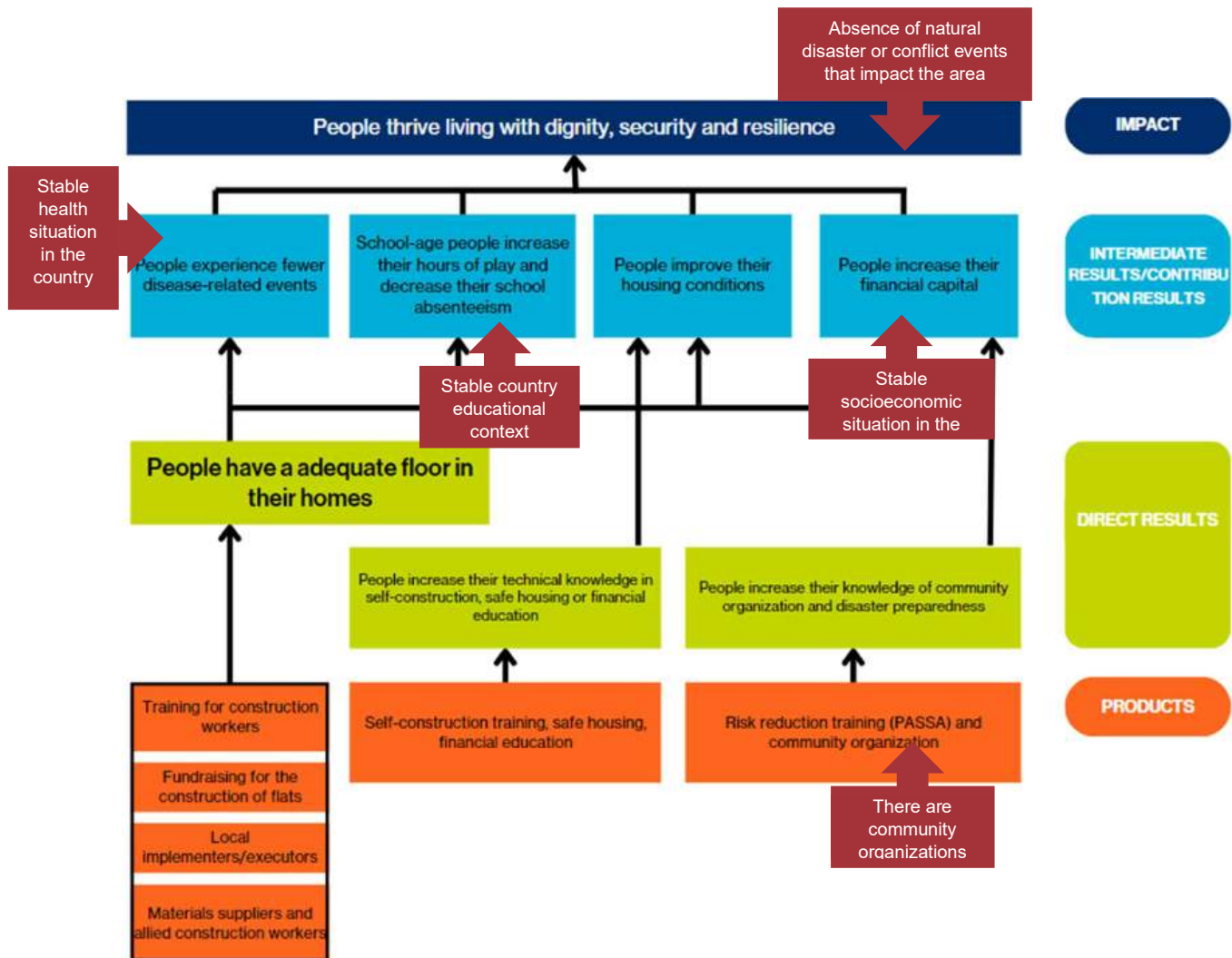
Therefore...

People will prosper through housing that fosters dignity, safety, and resilience.



The following figure diagrams this theory and its associated assumptions.

Figure 1. Theory of change for the regional 100,000 Floors to Play On initiative



This evaluation is specifically focused on understanding the relationship between installing adequate flooring and the quality of life of those mentioned in the ToC.

The section of the Dominican Republic for this first impact evaluation was based on the number of interventions it has completed and the capacity it has installed to accompany these. As of July 2024, HFH Dominican Republic has installed 2,359 floors, representing approximately 20% of all the floors installed in the region.

The below data were collected between May and October of 2023, a period affected by floods, hurricanes, a Dengue crisis, and growth in the feminization of poverty across the Dominican Republic. The results should be taken with these factors in mind, particularly as they relate to the assumptions stated in the ToC.

Purpose of this evaluation

This evaluation was conducted after the 100,000 Floors to Play On initiative was implemented in the communities involved in this study and aims to measure its contribution (the effects experienced by beneficiaries between a “before” and “after” period) and impact (the difference between two groups

sharing the same characteristics apart from having received or not received the intervention). The study therefore allows us to determine to what degree the results can be attributed to the initiative.

The importance of evaluating impact is that it allows us to better understand the effects that installing adequate floors has on aspects such as economic development, wellbeing, academic attendance and time spent playing in the home. It also allows us to reflect on the initiative and provides evidence of its impact, which can in turn lead to other knowledge products to expand and strengthen it. This study will also serve to increase evaluation capabilities in the region by establishing a tried-and-tested method that can be replicated in other contexts, whether for this initiative or others.

Conceptual framework

The main tenet of this evaluation is that there is a relationship between adequate flooring and things like economic development, wellbeing, academic attendance and play time in the home. This relationship is supported by academic studies on housing, which helped us determine the specific dimensions that the evaluation addresses, based on HFH's principles and priorities in the region.

A study by Mitchell and Macció (2015), for example, found that poor housing conditions have a negative effect on the education of school-age children, since such deficiencies prevent them from spending time inside the home in an environment that is conducive to learning and provides enough space to fulfill academic obligations. Concrete floors help create more adequate conditions.

Mitchell and Macció's study has found that a home's habitability influences the economic development of the families that live there, with poor housing conditions making lower-income households less likely to progress in material terms.

Likewise, in a study funded by the University of Berkeley and the World Bank, Cattaneo et al. (2023) affirmed the relationship between health and wellbeing and adequate flooring. This study revealed that those with better quality floors had fewer respiratory, skin, and gastrointestinal illnesses than those with poor quality floors.

The study also found that those with better floors experienced better mental health and a greater sense of satisfaction with their home and quality of life. This shows that implementing this type of improvement to the home strengthens the development of those who live there.

Evaluation questions and indicators

The OECD (Organisation for Economic Co-operation and Development) criteria used for this evaluation is the contribution and impact of the effects observed in the target population and the determination of the extent to which these effects can be attributed to the intervention. It does not address any adverse effects it might produce.

The first dimension of the evaluation is economic development, comprising the following qualitative indicators: financial capital; physical capital (specifically the category of housing infrastructure, which is most relevant to HFH LAC); expenditures on home improvements; and expenditures on respiratory, skin, and gastrointestinal illnesses.

The second dimension is wellbeing, comprising the categories of satisfaction with housing (pertaining to a qualitative indicator measuring the relevancy of HFH LAC's construction interventions); satisfaction with flooring; and perceived stress.

The final dimension refers to concrete academic development and comprises: the average number of school absences and the average number of hours that children spend playing inside the home.

For each dimension we established a series of variables and corresponding questions and/or affirmations (see Annex 1).

Figure 2. Summary of evaluation dimensions and indicators



For each dimension, we posed the following questions:
What is the percentage contribution?
What is the percentage impact produced by the initiative?

Stakeholder participation

The evaluation dimensions are based on the initiative's ToC, the development of which included participation from HFH LAC technical staff involved in the initiative and validation by other AO departments as well as staff working to implement the initiative in each country. The instruments and process used was designed by HFH LAC, while the MEAL team at HFH Dominican Republic was responsible for determining the population to be surveyed and collecting data in the field, with guidance and accompaniment from HFH LAC.

Ethical considerations

One of the greatest challenges of this impact evaluation was to adequately manage the expectations of the participating communities. It was crucial to consistently and clearly inform people that the survey did not imply the allocation of any individual benefit.

The ethical complexity of this situation centered on the need to guarantee equanimity and impartiality in the process of selecting each group while also respecting the fundamental ethical principles of justice and benevolence towards all participants in the study. It was therefore imperative to approach this challenge carefully and reflectively, considering the potential impact on both the beneficiaries of the initiative and the participants in the comparison group.

To address these considerations, we organized initial meetings with community leaders or spokespeople to jointly identify potential individuals in the community, ensuring their informed and voluntary participation. Additionally, we fostered a sense of respect and consideration toward the communities at all times and worked to ensure that relationships were based on coordination and collaboration to facilitate data collection after the initiative's completion.

The surveys included participants' persona data, which in each case required their prior informed consent as a requirement for applying the evaluation instrument. The data was processed, and the information shared in a confidential manner.

Evaluation design and methodology

This impact evaluation is quantitative in nature and relies on the difference-in-differences (DiD) method, a quasi-experimental technique used to estimate the causal effects of an intervention on a specific group. Unlike random experiments, in which participants are randomly assigned to treatment and control groups (or, in our case, beneficiary and comparison), DiD does not require randomization and is based on the examination of changes in outcomes of interest among a group of beneficiaries and a comparison group over time.

The DiD method consists of a double difference based first subtracting the result of the beneficiary group after (GB_1) and before the initiative (GB_0), then repeating this same procedure with the comparison group. Finally, the comparison group outcome is subtracted from the beneficiary group outcome to obtain the value of the impact generated by the intervention (Hernández y Mata, 2015).¹

$$DiD = (GB_1 - GB_0) - (GC_1 - GC_0)$$

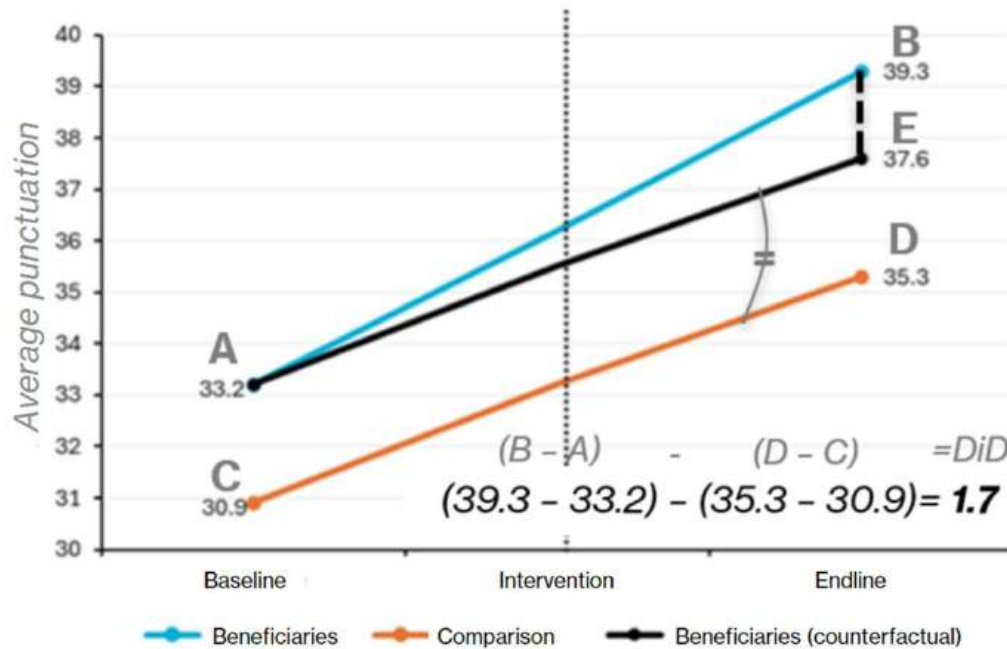
This method generates a counterfactual estimation² of the change in the beneficiary group, assuming that this group would have maintained the same trend as the comparison group had it not received the intervention (the parallel trend assumption). For this to be possible, the model assumes that the two groups share similar characteristics with no significant differences in their average scores.

¹ Hernández y Mata (2015) offer a detailed example of the application of the difference-in-differences model: <https://revistas.ucr.ac.cr/index.php/economicas/article/download/19964/20196/44833>

² A counterfactual estimation is a prediction of what would have happened if a variable or event had been different. In this case, the counterfactual estimation shows what would have happened to the beneficiary group in a given dimension if they had not installed a concrete floor, using the comparison group (those who did not receive a floor) as a baseline.

For example, if we compare the difference in the rate of respiratory illness before and after the installation of concrete floors in the beneficiary group and the difference in the rate of respiratory illness before and after the installation of concrete floors among the comparison group, if the DiD is statistically significant, we can conclude that the installation of concrete floors had a causal effect on the reduction of respiratory illness in the beneficiary group.

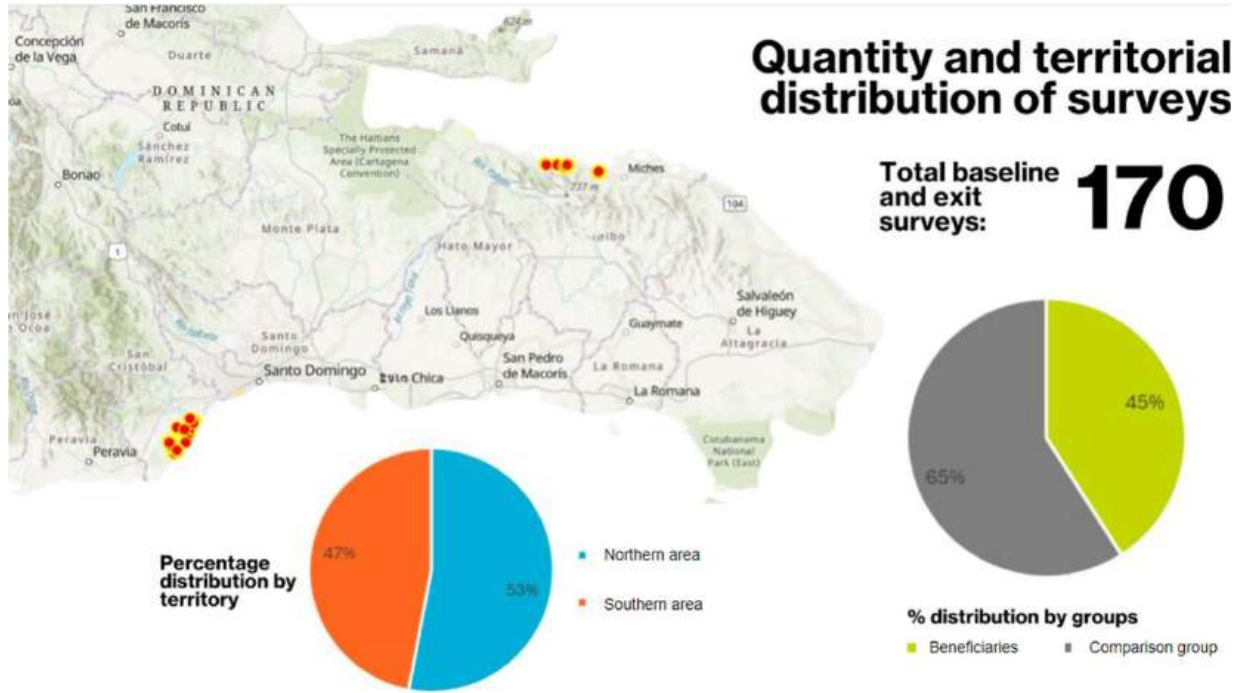
Figure 3. Example of the difference in differences (DiD) model applied to the initiative



Additionally, it is not necessary that the data used for the evaluation originate from a panel group. In other words, we do not need to measure the same individuals; it is enough that the groups share similar characteristics. For this evaluation, we ensured that variables related to sex, age, and head-of-household education and income level for each group had no statistical difference.

To select the survey participants, we identified potential participants in specific communities that had received floors and participants in a comparison group that shared the same demographic, socioeconomic and territorial characteristics. This resulted in selecting the communities of El Seibo and San Cristóbal, with the participants distributed in the following manner:

Figure 4. Distribution of the population surveyed



For both the beneficiary and the comparison group, we conducted our data collection through the Survey 123 platform. This instrument divides data by characteristics, recording the general conditions of the families involved as well as variables related to the substantive dimensions of measurement.

To process and analyze the data we then used an analysis plan, executed through the SPSS and R programs. For this particular evaluation we decided not to cross check independent variables such as sex, age, or head-of-household education level, since the volume of data was limited. For each indicator we calculated the DiD in both absolute terms and percentages, and then determined the statistical difference.

Findings

Characteristics of the target population, presented as the “average homeowner”

If the population surveyed was a single person, it would resemble Railini:



Railini
43 years old

She lives in a small house with a dirt floor in the town of La Gina in Miches, which is a coastal and tourist area in the Dominican Republic.

Education:
Could not complete primary school

About her family:
She lives with her 74-year-old mother and 2 children: a 10-year-old girl and an 8-year-old boy

Occupation and income:
She works as a waitress in a restaurant that serves tourists located in the city of Miches earning a monthly income of US\$170

ECONOMIC DEVELOPMENT

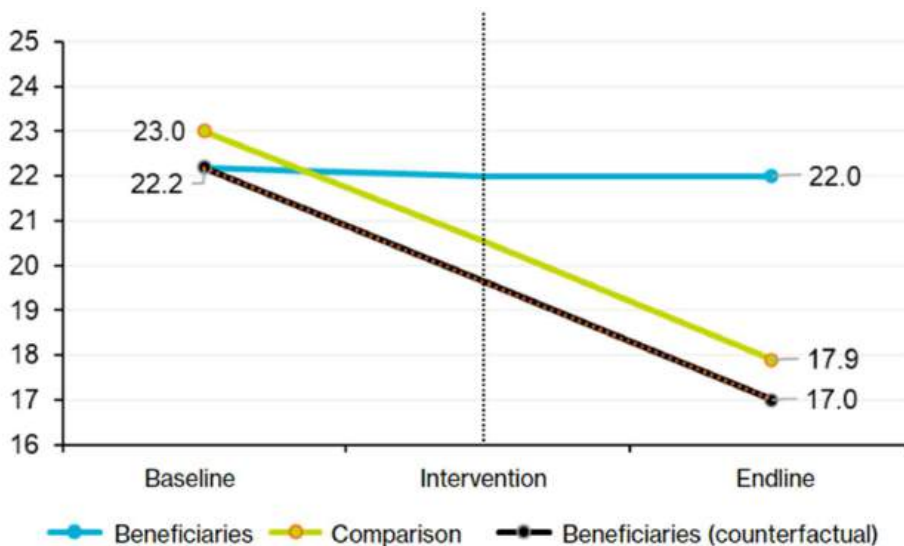
Financial capital

Financial capital is an HFH LAC qualitative indicator defined as the amount of financial resources a family has to support themselves. This is divided into two categories: a) income, expenses, savings and investments and b) sources of financing.

The first category is the measure to which one's income allows them to cover their basic daily needs as well as save and invest in the future. The beneficiary group showed a 1% reduction between the initial and final measurement, while the comparison group experienced a 22% reduction, resulting in a statistically significant difference of 5%.

In terms of absolute value, this corresponds to a DiD of 5 points. In other words, if the beneficiaries had not received a concrete floor, they would have had 22% less in income, savings and investments.

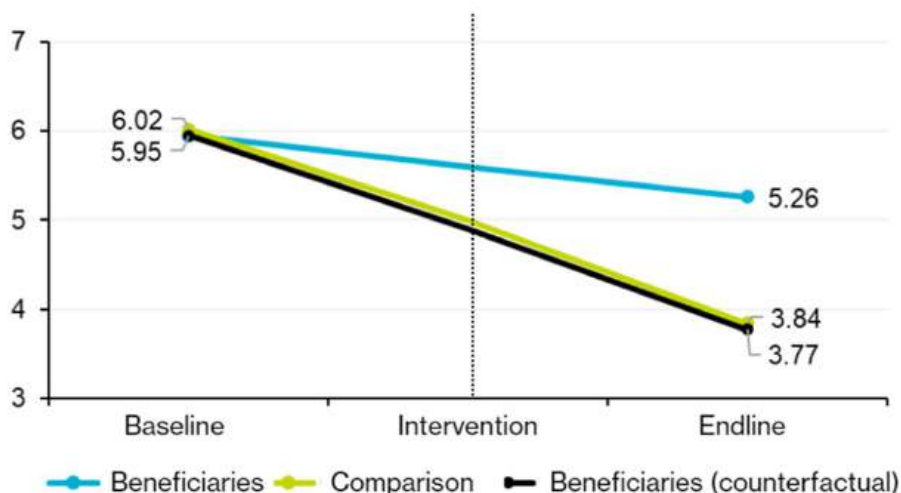
Table 1. Average score in the category of income, expenses, savings and investments for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation



The sources of financing category is defined as the degree to which one can access financing from sources such as banks, cooperatives, social assistance organizations and individuals. In this case, participants in the beneficiary group showed a 12% average reduction, while those in the comparison group fell by 46%, resulting in a statistically significant difference of 1%.

The DiD for this category is therefore 1.49 points. In other words, beneficiaries would have had 25% less access to financing if they had not received a concrete floor.

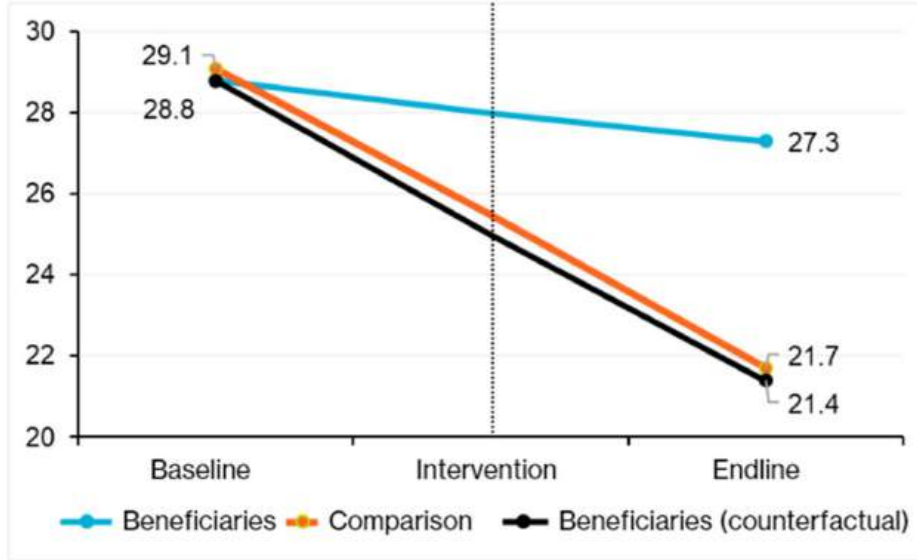
Table 2. Average score in the sources of financing category for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation



Adding these categories together allows us to obtain the total score for the financial capital indicator. This was estimated by determining that the beneficiary group had a 5% average reduction, while the comparison group had a 25% reduction, resulting in a statistically significant difference of 5%.

Therefore, this indicator shows a total DiD of 5.9 points, suggesting that beneficiaries would have had 20% less financial capital had they not improved their floor.

Table 3. Average score in the financial capital indicator for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation



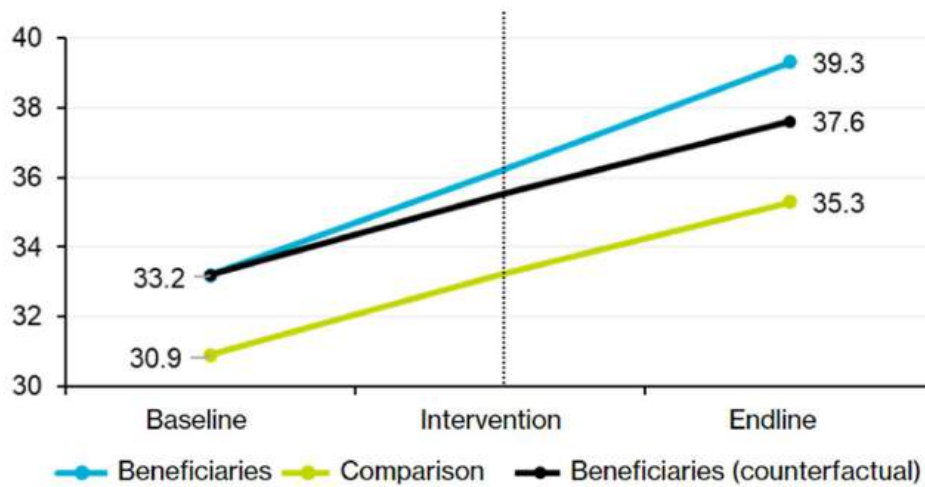
Physical capital

Physical capital is an HFH LAC qualitative indicator defined as the basic infrastructure and production-related goods required to strengthen one’s livelihood. It comprises two categories. However, for the purposes of this evaluation we have only selected one: that of housing infrastructure, defined as one’s perception of the cost, quality, appropriateness and appearance of their home.

For this indicator, the beneficiary group showed an average increase of 18%, while the comparison group showed an average increase of 14%, resulting in a statistically significant difference of 5%.

In terms of absolute value, this results in a DiD of 1.7 points, suggesting that the beneficiary families had a 4% more positive perception of the cost, quality, appropriateness, and appearance of their homes as compared to what their perception would have been had they not improved their floor.

Table 4. Average score in the housing infrastructure category within the physical capital indicator for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation

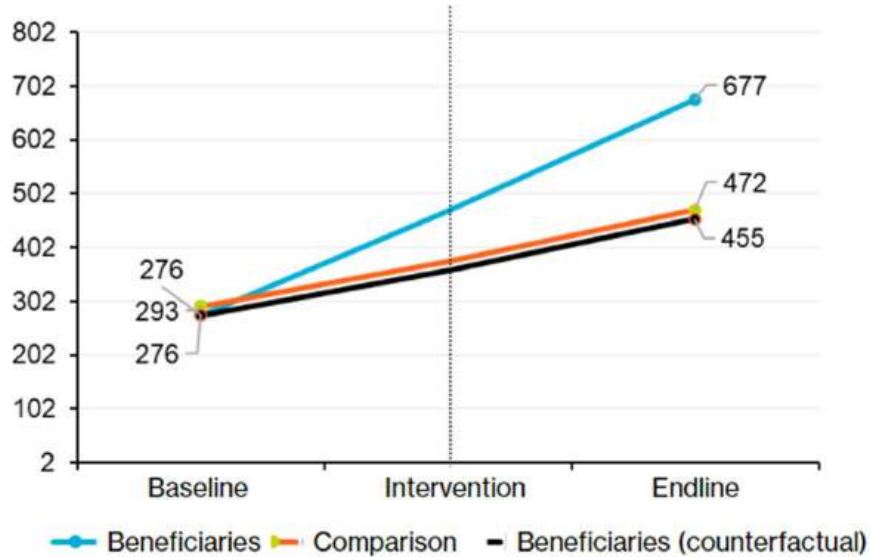


Investment in the home

This refers to the dollar amount invested in home repairs or improvements over the last three months (measured in Dominican Pesos and converted to USD for the purpose of this report). In this case, the beneficiary group showed a 43% average increase while the comparison group showed a 31% increase. This results in a statistically significant difference of 5%.

The DiD is therefore equivalent to an impact of roughly USD 222 more that beneficiaries put towards home repairs and improvements on average, compared to not having received a new floor.

Table 5. Average investment in the home (in USD) over the last three months for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation

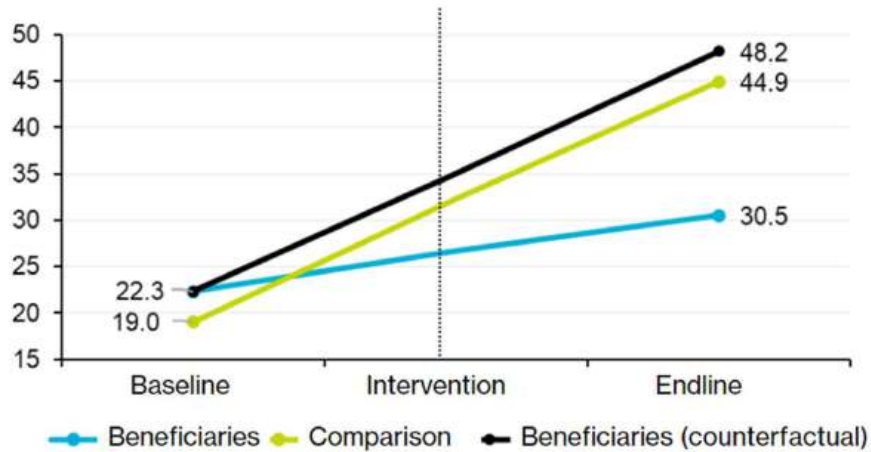


Health-related expenses

This corresponds to the sum of all expenditures made to address respiratory, skin, and gastrointestinal illnesses in the last month. In this case, the beneficiary group showed an increase of 37%, while the comparison group showed an increase of 136%.

In absolute terms, this implies a DiD of USD 17.90 and means that the beneficiary group had a 79% greater chance of spending money on health issues compared to not having received a new floor.

Table 6. Amount spent on health-related expenses in the last month for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation



Floors and economic development

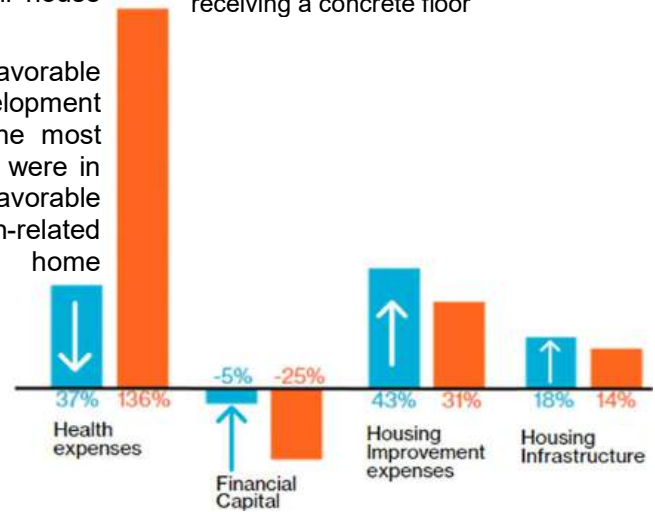
Both groups experienced a reduction in the financial capital indicator and its respective categories. This can be explained by the unfavorable situations that occurred in these communities during the study period, as stated above. Nevertheless, the new concrete floors allowed the beneficiary group to better face these challenges. In other words, having better flooring conditions promotes stability and sustenance amidst the stressors and challenges that may arise.

Both groups increased their level of physical capital and investment in the home. However, those with adequate floors showed a steeper increase. While it is true that health-related expenditures increased for both groups, this increase was substantially greater among those who had not benefited from the initiative.

Spending substantially less on health issues in turn allowed those in the beneficiary group to cover their basic needs and invest more in their homes, which improved their perception of the quality of their house and infrastructure.

The presence of a concrete floor proved more favorable for all indicators in the economic development dimension, compared to not having one. The most substantial contributions the new floors made were in terms of greater financial stability despite unfavorable conditions, combined with fewer health-related expenses and larger investments in home improvements or repairs.

Figure 5. Percentage difference per indicator in the economic development dimension for the beneficiary and comparison groups before and after receiving a concrete floor



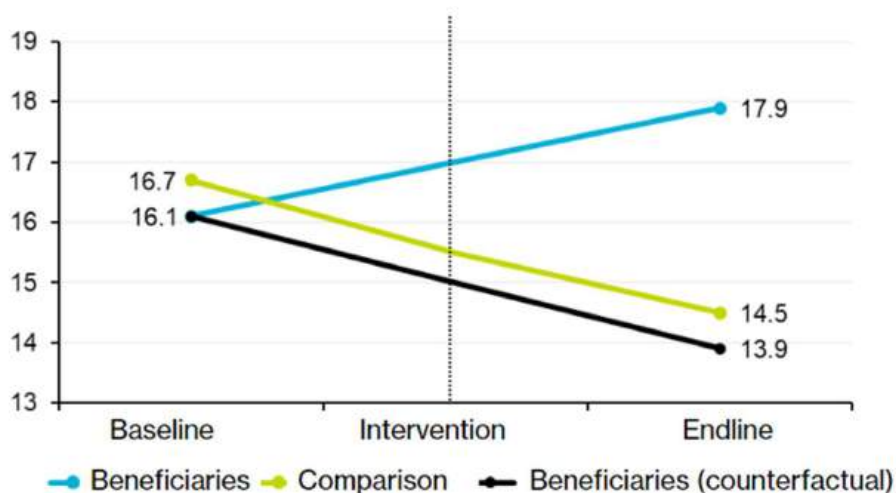
WELLBEING

Satisfaction with housing

Satisfaction with housing is a category within the HFH LAC qualitative indicator “relevance of construction interventions,” and refers to one’s level of satisfaction with their home in terms of spatial needs, construction materials, housing-related costs, safety, and other factors.

The beneficiary group showed an average increase of 11% between the initial and final measurements. The control group, on the other hand, showed a decrease of 13% in the same period. The DiD between the initial and final measurements was therefore 4 points, suggesting that having received an adequate floor makes one 25% more satisfied with their housing situation as compared to not having received one. This results in a statistically significant difference of 5%.

Table 7. Average score in the satisfaction with housing category within the relevance of construction interventions indicator for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation

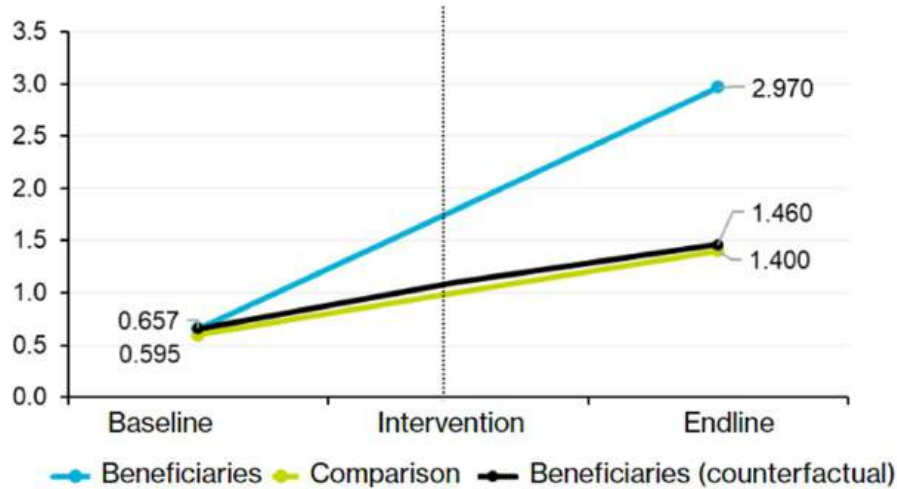


Satisfaction with flooring

With respect to one’s level of satisfaction with the flooring in their home, the beneficiary group showed a 352% average increase between the initial and final measurement. The comparison group also showed an increase, though of only 135% in the same period.

The DiD between the initial and final measurement for both groups thus received an average score of 1.57 points. This suggests that receiving a concrete floor made the beneficiary group 239% more likely to be satisfied with their housing situation compared to not having received one, representing a statistically significant difference of 1%.

Table 8. Average score in the satisfaction with flooring category for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation

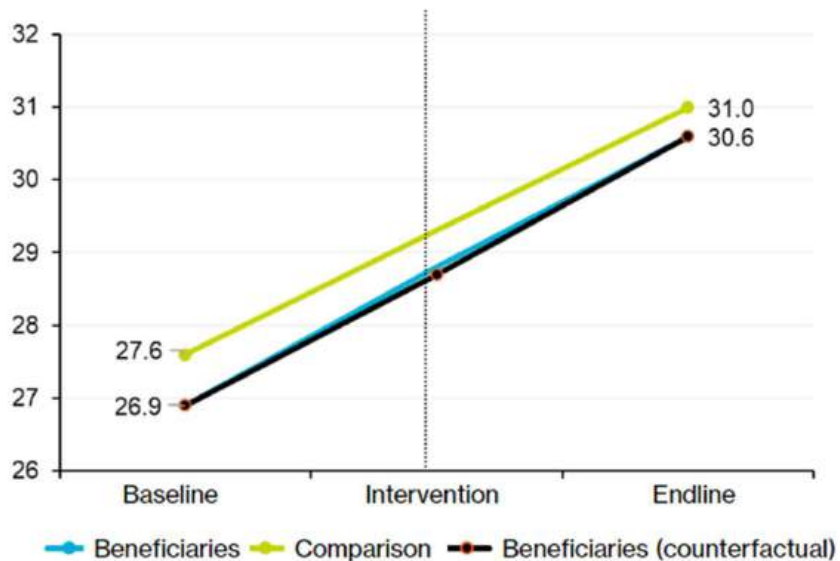


Perceived stress

For this category we used the perceived stress scale (Cohen et al. 1983), which uses a self-reporting instrument to measure one’s general psychological response to certain stressors. The beneficiary group reported an average improvement of 14% between before and after the installation of the new floor, while the comparison group reported an increase of 12% in the same period.

The DiD between the initial and final measurements for both groups averaged 0.3 points, suggesting that having an adequate floor lowered stress by 1% as compared to not having one.

Table 9. Average score in the perceived stress category for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation



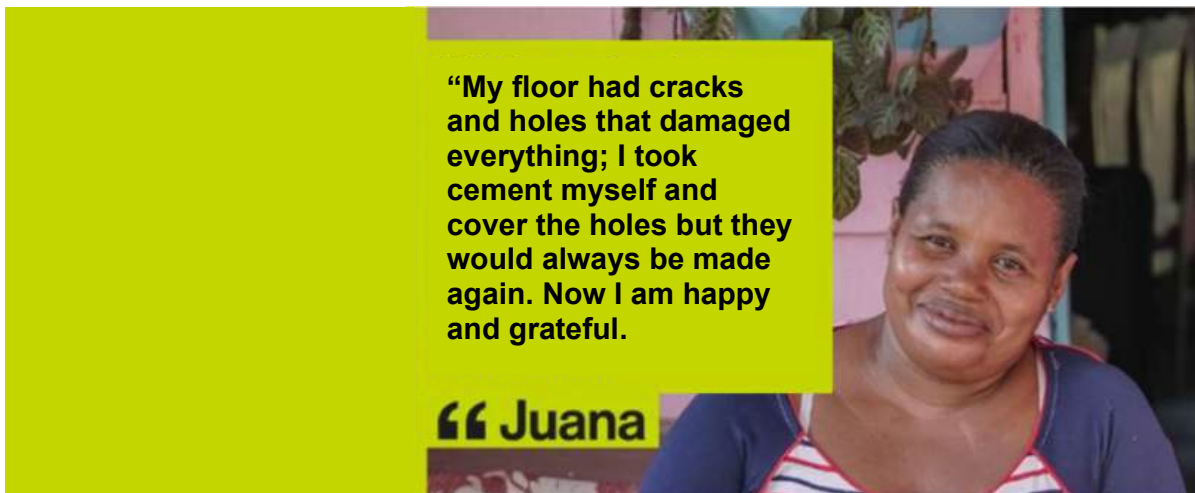
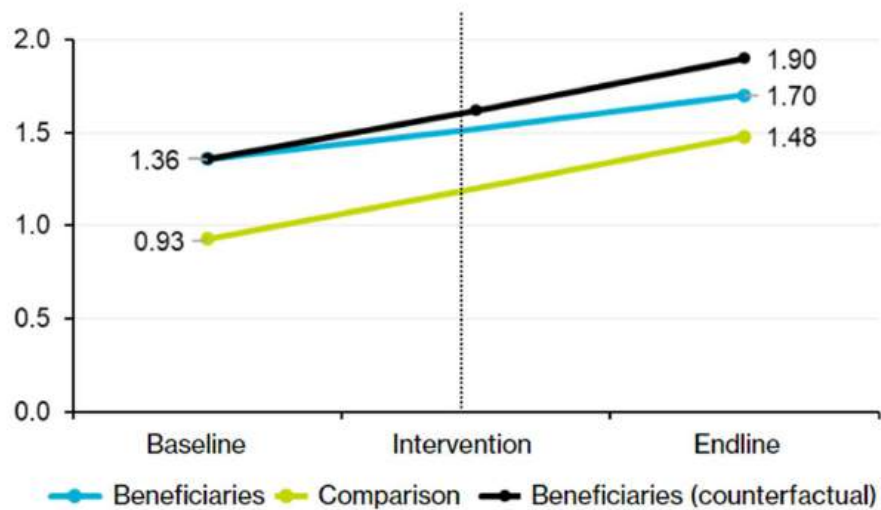
ACADEMIC ATTENDANCE AND RECREATION

Academic attendance

To measure academic attendance, participants were asked how many times their children had missed school in the last month, which we used to calculate the average number of days per group. Children in the beneficiary group showed an average increase of 25% in school absences before and after the floor was installed. Children in the comparison group had a 59% increase over the same period.

The DiD between the first and second measurement for both groups was an average of 0.2 days per month, suggesting that if children in the beneficiary group had not received a new floor, they would have missed 15% more days of school.

Table 10. Number of days children were absent from school in the last month for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation

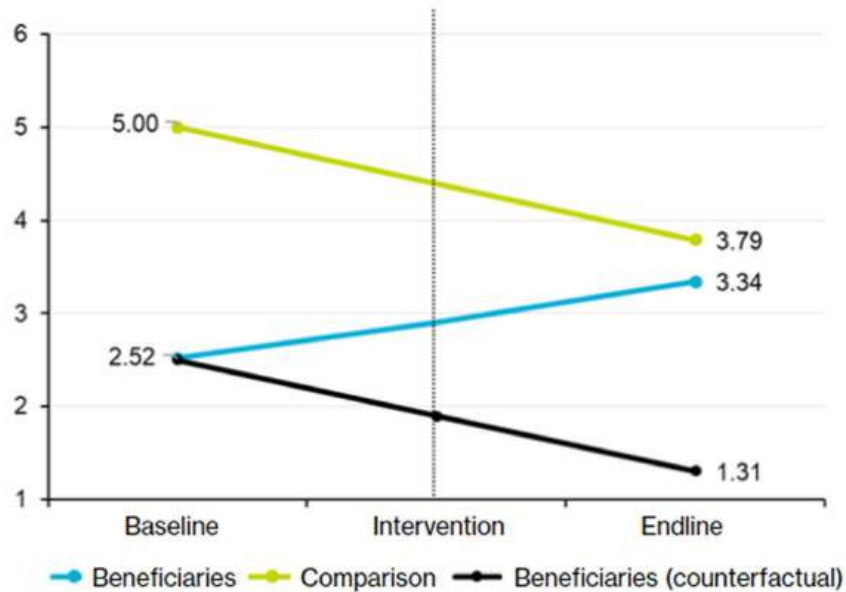


Hours of play in the home

To measure play time we calculated the estimated number of hours that children spent playing inside the home each day. Children in the beneficiary group increased their in-home play time by an average of 33% between the first and final measurement. Children in the comparison group decreased their in-home play time by 24% in the same period.

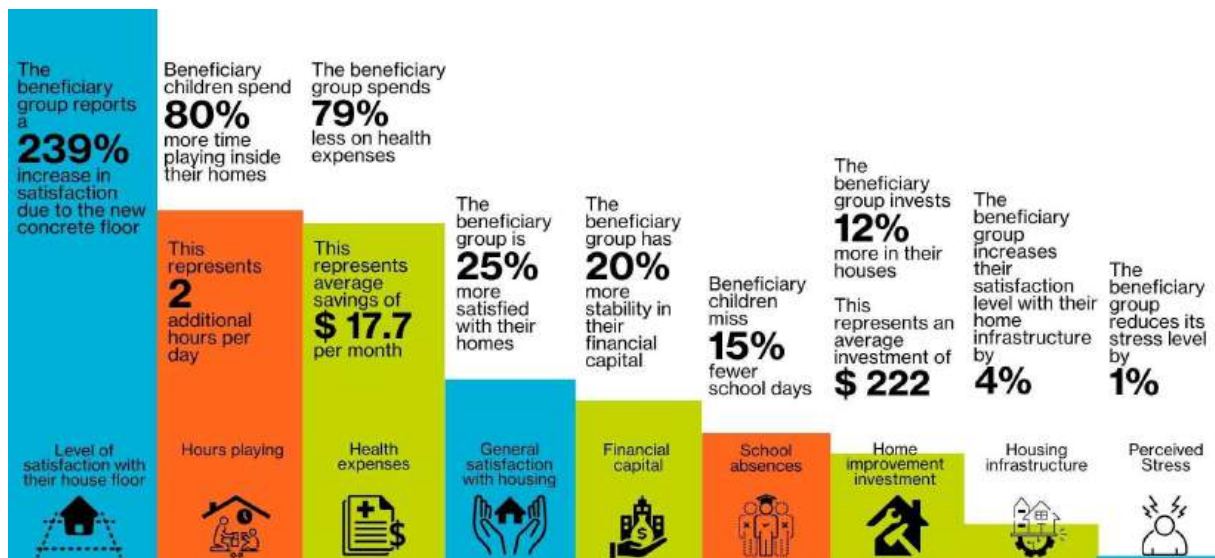
The DiD between the first and final measurement for both groups was 80%, suggesting that the installation of adequate flooring allowed children in the beneficiary group to play for an additional two hours each day, compared to not having installed adequate flooring.

Table 11. Average number of hours spent playing in the home for the beneficiary and comparison groups before and after the intervention, along with the counterfactual calculation



What is the impact of a concrete floor on economic development, wellbeing, academic attendance and recreation?

Figure 6. Results per indicator (percentage), ordered by level of impact



Conclusions

In the economic development dimension, having an adequate floor was linked to favorable results for all the indicators measured. We found a greater level of financial capacity despite the adverse economic conditions present during the measurement period, including events such as floods, hurricanes, a Dengue crisis, and an increased feminization of poverty in the country. There were also lower expenditures on health-related expenses and higher investments in the home. In tangible terms, people who received a new floor spent 79% less on health issues, which led to a 20% improvement to how they perceived whether they had sufficient resources to cover their basic needs. Additionally, they invested 12% more in their homes, producing a 4% improvement in how they viewed their quality of life and infrastructure.

In terms of wellbeing, the most pronounced improvements were the beneficiaries' level of satisfaction with their floor (an increase of 239%) and their house in general (an increase of 25%). The presence of an adequate floor also produced a 1% reduction in stress.

In the dimensions of academic attendance and recreation, we found that an adequate floor helped children miss 15% fewer days of school and spend an additional two hours playing in the home.

Considering these outcomes, we can conclude that a concrete floor helps boost resilience by enabling people to better combat the trials and tribulations that may arise, including natural disasters, economic crises and disease outbreaks. This provides greater stability in terms of financial capital and lowers the amount of money families must spend on health issues, coupled with enabling greater investments in home repairs and improvements and increased satisfaction with the quality of their homes. Finally, an adequate floor has positive effects on stress and allows families greater control over school attendance and the amount of time that children can safely play in the home.

References

Cattaneo, M., Galiani, S., Paul, G., Martínez, S. & Tituunik, R. (2007). "Housing, Health and Happiness". *Impact Evaluation Series*, 14.

Cohen, S., Kamarck, T. & Mermelstein, R. (1983). "A global measure of perceived stress." *Journal of Health and Social Behaviour*, 24, 385–396.

Habitat for Humanity International LAC (2023). "Nota metodológica del proyecto piloto de medición de la iniciativa 100.000 pisos para jugar". Monitoring, Evaluation, Accountability, and Learning area, Operations Department.

Mitchell, A. & Macció, J. (2015). *Housing and Wellbeing: Evidence from the settlements of Buenos Aires*. Pontificia Universidad Católica Argentina.



Annexes

Annex 1. Definition of indicators and their key variables

ECONOMIC DEVELOPMENT

Indicator	Category	Variables
<p>Investment in the home: The amount of money spent on home improvements and repairs in the last three months (measured in local currency).</p>		How much have you spent on repairs or improvements to your home in the last three months (in local currency)?
<p>Livelihoods – Physical capital: The basic infrastructure and production-related goods required to strengthen one's livelihood.</p>	<p>Housing infrastructure: The perceived cost, quality, adequacy and appearance of one's house.</p>	Can your family cover all its household costs as well as other basic needs?
		Your house and the land it is situated on are legally registered.
		Your house is nice.
		Your house is large enough for everyone in your family to live there.
		You are sure that your family will be able to live in the house for a long time.
		Your house has a toilet or bathroom.
		Your house helps your family improve its quality of life.
		Your house is appropriate to your needs and surrounding environment.
		Your house has access to water.
		Your house has access to electricity.
		Your house has an appropriate cost.
		Your house was built with adequate construction techniques.
		The materials used to build your house were of adequate quality.
Your house is decent quality.		
<p>Livelihoods – Financial capital: The amount of financial resources a person or family has to support themselves.</p>	<p>Income, expenses, savings and investments: The measure to which one's income allows them to cover their basic daily needs as well as save and invest in the future.</p>	Your household income allows you to buy basic foodstuffs.
		Your household income covers clothing needs.
		Your household income covers the cost of education.
		Your household income covers electricity and water.
		Your household income covers telephone expenses.
		Your household income allows you to move forward.
		Those in your household who can work have stable employment.

		Your household income allows you to put money into savings.
		Your household income covers the cost of rent or mortgage.
		Your household income allows you to invest in purchasing in a home.
		Your household income allows you to invest in home repairs or improvements.
	Sources of financing: Access to sources of financing such as banks, cooperatives, social assistance institutions, individuals, etc.	Your household has access to loans from banks, cooperative, mutual funds, etc.
		Your household has access to loans from social assistance organizations.
		Your family has access to loans from individuals.
Health-related expenses: The sum of all expenditures on respiratory, skin and gastrointestinal illnesses.		Approximately how much do you spend on medical attention and/or the purchase of medication for respiratory, skin or gastrointestinal illnesses?

WELLBEING

Indicator	Category	Variables
Relevance of the construction intervention: The degree to which people in the community are satisfied with a construction intervention, including the technical assistance provided, the quality of services and infrastructure in the settlement, and how the intervention has strengthened local capacities to tackle construction processes and improve their community or neighborhood.	Satisfaction with housing: Level of satisfaction with one's house in terms of spatial needs, construction materials, cost, safety, etc.	The size of your house meets your family's spatial needs.
		You are satisfied with the cost of building or improving your home.
		Your house was built with good-quality materials.
		You are satisfied with the amount of water available in your home.
		You are satisfied with how far your household must walk to consume water.
		Your house is nice.
		Your house is protected from robbery.
Satisfaction with flooring: Level of satisfaction with the floor inside the home.		How satisfied are you with your floor?
Perceived stress: The perceived level of psychological stress, measured by the degree to which situations in day-to-day life are deemed stressful (Campos-Arias et. al, 2014, p.408).		In the last month, how often were you affected by an unexpected event?
		In the last month, how often did you feel unable to control important things in your life?
		In the last month, how often did you feel nervous or stressed?
		In the last month, how often did you successfully manage minor issues in your life?
		In the last month, how often did you successfully face major changes that had occurred in your life?

		In the last month, how often did you feel sure of your ability to manage your own problems?
		In the last month, how often did you feel like things were going well?
		In the last month, how often did you feel like you were unable to face all the things you had to do?
		In the last month, how often were you able to control the difficulties in your life?
		In the last month, how often did you feel like everything was under control?
		In the last month, how often did you feel upset because of things that were outside your control?
		In the last month, how often did you think about all the things you have left to do?
		In the last month, how often have you been able to control how you spend your time?
		In the last month, how often have you felt like there were more challenges than you could deal with?

ACADEMIC ATTENDANCE AND RECREATION

Indicator	Variables
Hours of play in the home: The number of hours that each child spends playing inside the home each day.	Approximately how many hours does (name of child) spend playing inside the home each day?
Academic attendance: The total number of days absent from school for each child in the last month.	How many times has (name of child) missed school in the last month?