

## User's Guide

# Housing Reconstruction Monitoring Dashboard

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## HURRICANES IRMA & MARÍA AND THEIR IMPACT ON PUERTO RICO

In September 2017, Puerto Rico was struck by two major hurricanes that caused widespread damage. Hurricane Irma, a category 5 storm, made landfall on September 6<sup>th</sup>, while Hurricane María, a category 4 storm, would follow on September 20<sup>th</sup>. The combined impact from these events left Puerto Rico's infrastructure in dire conditions, but it is their impact on housing which has had a negative and lasting effect on households and communities in the archipelago. *More than four (4) years since these events, communities, grassroots organizations, and other stakeholders need a clear and broad picture on how ongoing reconstruction efforts have been able to address housing needs in post-disaster Puerto Rico.*

According to the most recent Community Development Block Grant - Disaster Relief (CDBG-DR) Action Plan submitted by the Puerto Rico Department of Housing (PRDH), hurricanes Irma & María caused more than \$90 billion in damages.<sup>1</sup> Of those, \$37.7 billion relate to housing and private property damages, \$46.9 billion are from infrastructure damages, and \$6.7 billion are from economic losses. More than 500,000 housing units suffered significant damages by these events.<sup>2</sup>

So far, reconstruction funding allocated by the federal government has totaled \$64.6 billion<sup>3</sup>, signaling that total reconstruction spending will likely fall short of addressing all needs stemming from storm damages. According to numbers by the PRDH, federal funding allocated for housing recovery and reconstruction totals almost \$5.8 billion.<sup>4</sup> But there is a large gap between allocated funds and actual on-the-field spending on housing repairs and reconstruction. *Therefore, this begs the question, how is housing reconstruction advancing in Puerto Rico at present?*

## PUERTO RICO'S PRE-DISASTER HOUSING SITUATION

The combined, devastating impacts of Hurricanes Irma and Maria came on top of a range of housing problems that have been developing over the course of many years. Land tenure issues have barely improved throughout the past decades, given that the economy of Puerto Rico, even during its best years, has not ensured sufficient economic opportunities or led to the production of sufficient housing units for a large swath of the population. This has led to patterns of socio-economic segregation that inevitably create serious obstacles to social mobility and increases the possibility of displacement in poor and informal communities.

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<sup>1</sup> CDBG-DR Action Plan Amendment 7: [https://cdbg-dr.pr.gov/en/download/cdbg-dr-action-plan-amendment-7-substantial/?ind=1628285919808&filename=ADM\\_POLL\\_Action%20Plan\\_Amendment%207%20-%20SUBSTANTIAL%20\(EN\).pdf&wpdmdl=20677&refresh=6179e87d783201635379325](https://cdbg-dr.pr.gov/en/download/cdbg-dr-action-plan-amendment-7-substantial/?ind=1628285919808&filename=ADM_POLL_Action%20Plan_Amendment%207%20-%20SUBSTANTIAL%20(EN).pdf&wpdmdl=20677&refresh=6179e87d783201635379325)

<sup>2</sup> Ibid

<sup>3</sup> The Recovery Support Function Leadership Group State Profile for Puerto Rico: <https://recovery.fema.gov/state-profiles>

<sup>4</sup> CDBG-DR Action Plan Amendment 7: [https://cdbg-dr.pr.gov/en/download/cdbg-dr-action-plan-amendment-7-substantial/?ind=1628285919808&filename=ADM\\_POLL\\_Action%20Plan\\_Amendment%207%20-%20SUBSTANTIAL%20\(EN\).pdf&wpdmdl=20677&refresh=6179e87d783201635379325](https://cdbg-dr.pr.gov/en/download/cdbg-dr-action-plan-amendment-7-substantial/?ind=1628285919808&filename=ADM_POLL_Action%20Plan_Amendment%207%20-%20SUBSTANTIAL%20(EN).pdf&wpdmdl=20677&refresh=6179e87d783201635379325)

The real estate and financial crisis that struck Puerto Rico in the mid-2000s (and continues to affect the island today) has resulted in a market imbalance in which there is excess housing at market prices and an unsatisfied demand for affordable housing. This is evidenced in the large number of vacant units<sup>5</sup> throughout the island, a growing affordability crisis<sup>6</sup>, and the long waiting lists for public housing and Section 8 vouchers<sup>7</sup>.

Lastly, the large number of homes located in flood zones<sup>8</sup>, the low number of insured dwellings<sup>9</sup>, and inadequate construction and non-compliance with building codes<sup>10</sup> increased the vulnerability of hundreds of thousands of families prior to the hurricanes making landfall.

Given the precarious situation faced by many households prior to the September 2017 hurricanes, failure to address housing needs stemming from storm damages can render these communities even more vulnerable to displacement.

## THE HOUSING RECONSTRUCTION MONITORING DASHBOARD

The Housing Reconstruction Monitoring Dashboard is an interactive and dynamic tool that provides detailed data, at the municipal level, on housing damages and reconstruction investments related to Hurricanes Irma and María. It is an outgrowth of a larger academic project<sup>11</sup> focused on analyzing the provision of emergency housing relief through FEMA's Individual Assistance Program. The primary objective of the Dashboard is to keep an eye on housing reconstruction efforts throughout the post disaster period and raise awareness of the investments needed to effectively repair the widespread damage caused by the 2017 storms.

All of the data used to build the tables and visualizations that make up the digital tool, and those contained in this report, are public. We have spent considerable time examining each dataset to produce initial analyses that provide a clearer picture of the ongoing housing reconstruction process.

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<sup>5</sup> In the most recent Puerto Rico Community Survey, the U.S. Census Bureau estimates that more than 300,000 housing units are vacant and out of the commercial and rental housing market in Puerto Rico. Nevertheless, these numbers are estimates—they cannot be considered an inventory—so there is no way to know the units' habitability, title status, or whether they are located in flood zones.

<sup>6</sup> According to the most recent Puerto Rico Community Survey, about 57% of renters pay more than a third of their income on rent, while 43% of mortgage holders spend more than a third on their income on housing costs.

<sup>7</sup> Prior to the 2017 hurricanes, waiting lists for public housing and Section 8 vouchers topped 25,000 and 7,950, respectively, according to the CDBG-DR Action Plan Amendment 7: [https://cdbg-dr.pr.gov/en/download/cdbg-dr-action-plan-amendment-7-substantial/?ind=1628285919808&filename=ADM\\_POLL\\_Action\\_Plan\\_Amendment\\_7\\_-\\_SUBSTANTIAL\(FN\).pdf&wpdmdl=20677&refresh=6179e87d783201635379325](https://cdbg-dr.pr.gov/en/download/cdbg-dr-action-plan-amendment-7-substantial/?ind=1628285919808&filename=ADM_POLL_Action_Plan_Amendment_7_-_SUBSTANTIAL(FN).pdf&wpdmdl=20677&refresh=6179e87d783201635379325)

<sup>8</sup> FEMA and the Planning Board estimate that more than 200,000 properties are located in flood zones. See Caribbean Business (2018): Junta de Planificación y FEMA estiman que existen 200,000 residencias en zonas inundables <https://cb.pr/junta-de-planificacion-y-fema-estiman-que-existen-200000-residencias-en-zonas-inundables>

<sup>9</sup> According to the PRDH's Action Plan, some 150,907 homes had private insurance and 3,991 had flood insurance.

<sup>10</sup> The PRDH's Action Plan states that between forty-five and fifty-five percent of the homes in Puerto Rico were built "informally".

<sup>11</sup> As part of this project we submitted an article, Who Gets Emergency Housing Relief? An Analysis of FEMA Individual Assistance Data Following Hurricane María, to a peer reviewed academic magazine.

As new programs emerge and investments increase, we will update the digital tool and expand our research portfolio.

## **PRIOR RESEARCH ON FEMA'S IA PROGRAM IN PUERTO RICO**

Numerous reports from the media and advocacy groups in Puerto Rico during the immediate months after the storms, highlighted how FEMA's IA Program was rife with complaints and inconsistencies regarding applicant approvals and denials of support. In light of these complaints, we sought to examine a key issue: were key populations, including renters, poor households and those without secure tenure or located in geographically vulnerable areas prone to being unattended or underserved?

Using applicant-level data produced by FEMA, we explored the administrative determinations of the IA Program, including whether poor households and those located in Puerto Rico's Special Communities were unfavorably served. Through this analysis we were also able to better understand which municipalities were most affected and which applicant households suffered the most damages, based on FEMA inspections.

Our results showed that, at the aggregate level, applicant households were not likely to be excluded from receiving emergency aid if they were poor or located in a Special Community. In fact, those households were more likely to have been inspected by FEMA and receive increased monetary assistance. On the other hand, households lacking clear property titles fared much worse than homeowners, even after controlling for numerous socioeconomic variables.

Damages were a key determinant to receive assistance. Nonetheless, less than half of inspected households with damages received funds from the IA Program. Perhaps more importantly for the ongoing reconstruction process, we calculated the difference between FEMA's damage estimates and the amount of funds disbursed through the program—an indicator we call “pending housing need”—and found that households with significant damages had high housing pending needs, and that poor households also had higher pending needs than non-poor households.

Our goal now, then, would be to determine housing pending needs, which would take into account all damages and all repair and reconstruction investments that have taken place so far.

## **MEASURING PENDING HOUSING NEEDS IN THE RECONSTRUCTION PERIOD**

Our research finding that significantly damaged and poorer households tend to be left with larger pending housing needs shortly after the passing of Hurricane María prompted us to examine the relationship between housing damages and assistance at a larger scale and during a longer time period. Specifically, we sought to better understand how much damage the housing sector had

endured in the island, and whether the assistance provided through reconstruction programs deployed in the years after the storms were helping fill the needs of those on-the-ground. Because damages were not evenly distributed across the island, we also wanted to know which communities were facing larger pending housing needs. Unfortunately, given data availability issues, we were only able to aggregate data on damages and assistance at the municipal level.

## CALCULATING HOUSING DAMAGES

Housing damages were calculated using applicant-level data from FEMA's Individuals and Household Program (IHP), the subprogram which offers financial assistance and direct services to disaster victims who are uninsured or underinsured. The downloadable data is provided through the OpenFEMA portal and includes information for numerous disasters that have occurred since 2002. We filtered the large, raw dataset to include only cases pertaining to Hurricanes Irma and María's impact on Puerto Rico (DR-4336 & DR-4339).

Although FEMA inspections are the most comprehensive source of damage information, the method used by the agency to calculate losses tends to underestimate full repair costs. Taking this into account, we inflated FEMA verified losses by 6.96, the multiplier based on comparative SBA<sup>12</sup> damage estimates that was used by the Government of Puerto Rico to account for the underestimated FEMA damage figures and create more realistic real property loss estimates (see Puerto Rico's CDBG-DR Action Plan, p. 64)<sup>13</sup>. Because FEMA did not inspect or provide damage estimates for all applicants, we performed an additional calculation that assigned the average municipal FEMA verified loss (multiplied by 6.96) to IHP applications reporting home damages that were not inspected or assisted by the program.

Based on these estimates, the resulting housing damages caused by Hurricanes Irma and María totaled over **\$18.55 billion**. We are aware that this is a conservative estimate in comparison with the PRDH's estimate of \$37.7 billion, but one that we believe best captures the financial requirements to achieve *reasonable repairs* for the island's housing stock.

## HOUSING EMERGENCY ASSISTANCE AND RECONSTRUCTION PROGRAMS

In order to determine how many investments have been made, to date, to repair the housing damages caused by the 2017 storms, we added the figures for both emergency assistance and reconstruction programs, namely FEMA's IHP, *Tu Hogar Renace*, SBA's Disaster Loans, and PRDH's Home Repair, Reconstruction or Relocation Program (R3), while accounting for private homeowner's insurance.

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<sup>12</sup> The SBA conducted numerous inspections as part of the application approval process for Disaster Loans that it granted in Puerto Rico after Hurricanes Irma and María.

<sup>13</sup> See CDBG-DR's Action Plan for Puerto Rico, p. 64

Emergency assistance funds are usually provided in the immediate aftermath of the disaster event, while reconstruction programs are rolled out once action plans are approved and federal funds are allocated and disbursed.

### ***FEMA Individual Assistance***

The IHP dataset used to calculate damages also provides detailed figures on IA funds awarded for housing repair and replacement. According to FEMA, over \$551 million was awarded for repairs and \$88 million for housing replacement—totaling over **\$639 million** from FEMA to address damages related to Hurricanes Irma and María.

### ***SBA Disaster Loans***

The SBA also provided loans of up to \$200,000 dollars for qualified homeowners who wished to repair or replace their homes. Given Puerto Rico's high poverty levels, these financial instruments are not accessible for a large proportion of the population. According to agency figures, over 53,000 loans to address real estate needs were approved in Puerto Rico following Hurricanes Irma and María. In total, over **\$1.38 billion** was provided through the SBA home loans.

### ***Tu Hogar Renace***

The *Tu Hogar Renace* program was created shortly after Hurricane María with funds from FEMA's Sheltering and Temporary Essential Power Program (STEP) to facilitate basic repairs so that survivors could shelter in their homes. It was administered by the PRDOH and, according to data provided by the agency, the program served over 117,000 units across Puerto Rico. *Tu Hogar Renace* has been one of the largest housing repair programs to date, with investments totaling **\$1.13 billion**.

### ***Home Repair, Reconstruction or Relocation Program (R3)***

Financed primarily through funding from the federal Department of Housing and Urban Development (HUD), the R3 program provides funding for the repair and reconstruction of single-family homes that were damaged by Hurricanes Irma and María. The program also provides funding to relocate homeowners who suffered significant damages and are located in hazard zones determined by the PRDOH. The program began in the Summer of 2019 and has received over 27,000 applications. As of February of 2022, close to 17,800 applications remain active and over 7,000 have been deemed eligible for reconstruction, repair or relocation awards. The PRDOH has completed just over 2,800 projects. Total R3 investments, to date, for repair and reconstruction amount to over **\$557 million**.

### ***Private Insurance Payments***

Payments made by private insurers to real estate property owners in Puerto Rico have also helped repair damages caused by the 2017 storms. According to data provided by the Office of the Commissioner of Insurance of Puerto Rico, close to 200,000 residential property claims related to Hurricane María were filed and over **\$921 million** has been paid to insurance holders. Nonetheless, the Commissioner's office does not produce data reports aggregated at the municipal level, so detailed figures are not included in the dashboard.

## CALCULATING PENDING HOUSING NEEDS

Pending Housing Needs were calculated using a very simple formula: we subtracted all the investments made through federal and local housing repair and reconstruction programs from the estimated housing damages for those IHP applicants lacking home insurance.

$$\text{Pending Housing Needs} = \text{Estimated Housing Damages for the Uninsured} - \text{Post Disaster Housing Assistance}$$

Because we lack data on insurance payouts by municipality, we did not include units covered by private insurance in our calculations for pending housing needs. Insured homes tend to be ineligible for most post disaster housing programs administered by federal or local governments given the comparatively large payouts provided by insurers. According to the IHP data, just over 555,000 applicants reported home damages and were uninsured.

To calculate post disaster housing assistance, we simply added all of the funds that have been invested for housing emergency assistance and reconstruction:

$$\text{FEMA IA Repair Assistance} + \text{FEMA IA Replacement Assistance} + \text{Tu Hogar Renace Awards} + \text{SBA Funds Approved for Real Estate} + \text{R3 Program Awards}$$

As of March 2022, pending housing needs in Puerto Rico amount to **\$11.622 billion**, or 63% of estimated damages to the uninsured. To better illustrate how post disaster housing needs are distributed across municipalities, we produced a map that calculates pending housing needs as a percent of housing damages for the uninsured. This indicator allows us to determine how far off municipalities are from meeting their pending housing needs. As the map presented on the dashboard shows, Fajardo, Las Piedras and Gurabo are well on their way to meeting their post disaster housing needs, while Culebra, Vieques and Maricao are lagging far behind.

*Last updated March 10, 2022.*