



Is Homelessness Increasing Due to Climate Change

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Introduction

- Homelessness is a complex issue which many countries around the world have been impacted by. The homeless are among one of the most vulnerable groups in developed regions who suffer from various hardships and higher rates of chronic diseases, respiratory illnesses, and mental/ physical impairments. According to the Centers for Disease Control and Prevention, homelessness is a significant public health issue. One contributing factor to homelessness is climate change. The effects of climate change have made issues like access to food, price of energy, and housing instability worse.
- The aim of this paper is to examine several categories, including various countries, quantity of homelessness, dwelling types and so on that contribute to the surplus homeless population across the world and examine possible approaches for improvement by analyzing data collected by the Organization for Economic Cooperation and Development (OECD) in the hopes of creating policy interventions to address homelessness in the context of climate change.
- The presentation will begin with exploring the contributing factors of homelessness and the methods used to gather and analyze data. The results of the analysis will be presented and discussed in detail. Finally, the presentation will conclude with a discussions and future work.



Understanding Homelessness

According to the Organization of Economic Cooperation and Development (OECD), homelessness has multiple definitions.

- People living rough: These are individuals who live in public spaces or on the streets without any form of shelter.
- People in emergency accommodation: This category includes people who have no usual place of residence and move frequently between various types of accommodation such as overnight shelters.
- People living in accommodation for the homeless: This group comprises individuals who live in accommodations for the homeless, where the period of stay is time-limited and no long-term housing is provided. Examples include homeless hostels, temporary accommodation, transitional supported accommodation, women's shelter or refuge accommodation.
- People living in institutions: This category includes people who stay longer than necessary in health institutions due to lack of housing and those in penal institutions with no housing available prior to release.
- People living in non-conventional dwellings due to lack of housing: This category encompasses individuals who use non-conventional housing such as mobile homes, non-conventional buildings or temporary structures because of a lack of housing.
- People living temporarily in conventional housing with family and friends due to lack of housing: This group includes people who stay with family or friends temporarily due to a lack of housing.

Natural Disasters Contributing to Climate Change

Storms



Australia

Earthquakes

Flooding

Storms



United States

Earthquakes

Flooding

Storms



Japan

Very few
natural
disasters in
Germany



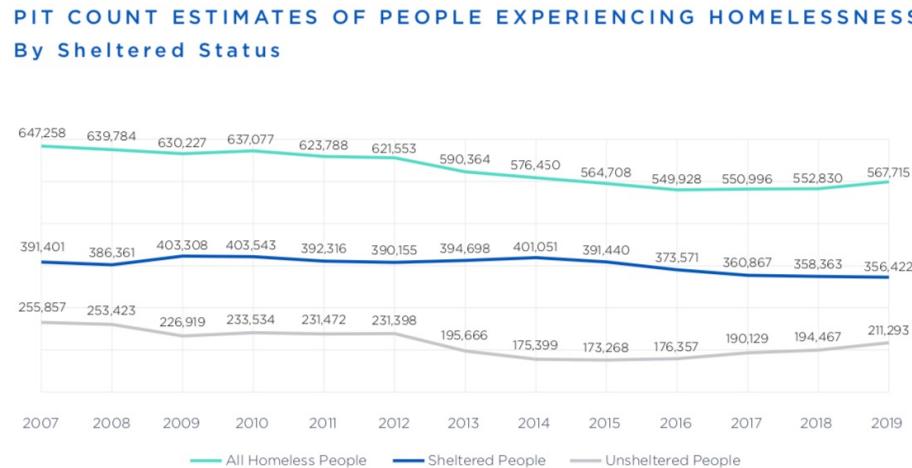
Germany

Storms



Slovenia

Methods and Data



Source: PIT Estimates of Homelessness in the U.S

<https://www.hudexchange.info/resource/5948/2019-ahar-part-1-pit-estimates-of-homelessness-in-the-us/>

- One of the ways homelessness is measured is through ‘point in time’, which counts people who are sleeping in shelters or on the streets.
- The figure illustrates an example of the ‘point in time count and data’ in the U.S
- The Department of Housing and Urban Development, which publishes the Annual Homeless Assessment Report to Congress, is the primary source of point-in-time figures in the US (AHARC).
- (Ortiz-Ospina & Roser, 2017)

Methods and Data

- To investigate the research question, I gathered comprehensive data from the OECD Database of existing studies on homelessness and climate change.
- My Country table includes the following countries: Australia, United States, Slovenia Germany, and Japan. These countries showed fluid data in the context of natural disasters relating to homelessness.

Country Table

	country_id [PK] integer	country_name character varying (100)	gdp numeric (12,2)	population integer	land_area numeric (10,2)
1	1	australia	1552667.36	256881	7692020.00
2	2	united states	23315080.56	331894	9147420.00
3	3	slovenia	61748.59	2108	20136.40
4	4	germany	4259934.91	83196	349390.00
5	5	japan	4940877.78	125682	364500.00

Methods and Data

The data shows the percentage distribution of three types of dwelling in different countries. The three types of dwellings are detached houses, flat/apartments, and other types of dwellings.

For instance, in Japan, 53% of the dwellings are detached houses, 44% are flats/apartments, and 0% are other types of dwellings.

In the United States, 63.% of the dwellings are detached houses, 26% are flats/apartments, and 6% are other types of dwellings. Similarly, the data shows the percentage distribution of these dwelling types in Slovenia, Germany, and Australia.

Dwelling Type Table

	country [PK] character varying (100)	detached_house integer	flat_apartment integer	other integer
1	australia	72	7	1
2	germany	27	56	3
3	japan	53	44	0
4	slovenia	67	28	0
5	united states	63	26	6

Methods and Data

The data below illustrates the number of homeless individuals and the homelessness rate in different countries.

For example, in Germany, there are 337,000 homeless individuals, representing a homelessness rate of 0.0041.

In the United States, there are 580,466 homeless individuals, representing a homelessness rate of 0.0018.

The data also shows the number of homeless individuals and homelessness rates in Slovenia, Australia, and Japan. The collected information can be used to compare how severe homelessness is in other nations.

Homelessness
Table

	country [PK] character varying (100)	num_homeless integer	homelessness_rate numeric (5,2)
1	australia	116427	0.48
2	germany	337000	0.41
3	japan	3992	0.00
4	slovenia	3799	0.18
5	united states	580466	0.18

Methods and Data

The data shows the relationship between the average monthly rent and GDP per capita in different countries. For instance, in Germany, the average monthly rent is 19.10 and the GDP per capita is 51,203.60. In the United States, the average monthly rent is 23.4 units of currency, and the GDP per capita is 70,248.6. Similarly, the data shows the relationship between rent and GDP per capita in Slovenia, Australia , and Japan.

We may use this information to better understand how different countries' GDP per capita affects the price of housing. People generally have better incomes when the GDP per capita is higher, which might increase home demand and, consequently, house costs. Housing costs, however, may also be influenced by other variables, such as governmental regulations or cultural norms towards home ownership. As a result, it's crucial to take into account a number of variables when examining the connection between property prices and GDP per capita.

Housing Price
Table

	country [PK] character varying (100) 	rent numeric (12,2) 	gdp_per_capita numeric (12,2) 
1	australia	23.80	60443.10
2	germany	19.10	51203.60
3	japan	20.30	39312.70
4	slovenia	14.00	29291.40
5	united states	23.40	70248.60

Methods and Data

The data demonstrates the relationship between different nations, homelessness, and natural disasters. For instance, 28,590 individuals became homeless as a direct result of the earthquake that occurred in 2000 in the United States.

Similarly, 4,119.9 individuals lost their homes as a result of the earthquake in Japan in 2000.

The data also demonstrates how flooding affects various nations, with 691,118 Americans becoming homeless as a result of floods in the United States in 2020. In addition, homelessness was caused by flooding in Slovenia and Japan, among other nations. Finally, the data displays how storms affect homelessness, with significant numbers of homeless people in Australia, Japan, and the United States in various years.

Natural Disaster Table

Data Output Messages Notifications

	disaster_id [PK] integer	disaster_name	country_name [PK] text	year integer	homeless_num_disasters real	
1		1	earthquake	japan	2000	4119.9
2		1	earthquake	united states	2000	28590
3		2	flooding	japan	2000	580
4		2	flooding	slovenia	2013	2711
5		2	flooding	united states	2020	691118
6		3	storms	australia	2010	719
7		3	storms	japan	1998	2000
8		3	storms	united states	1990	26186.9

This data highlights the destructive effects of natural disasters on homelessness in different countries. Natural catastrophes like earthquakes, flooding, and storms can cause considerable economic and social upheaval and force people to leave their homes. In order to prevent homelessness and assist those who are affected, it is crucial for governments and communities to mitigate and lessen the effects of natural disasters.

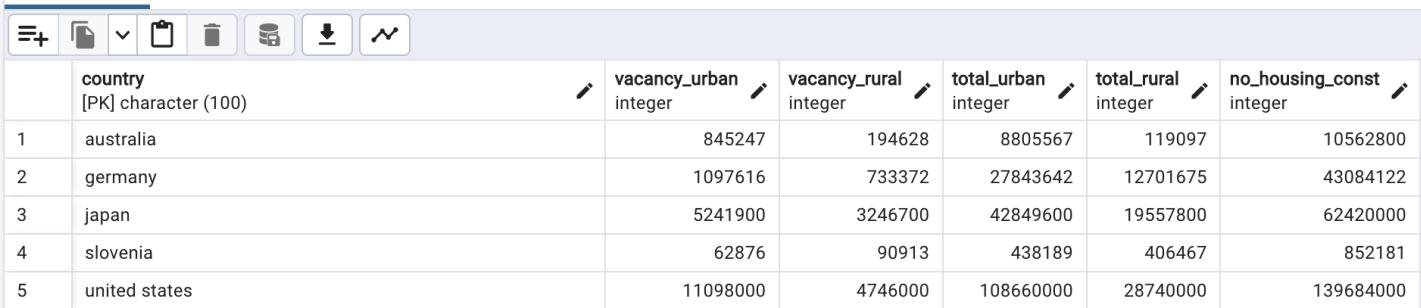
Methods and Data

The data provides statistics on housing in different countries, including the number of vacant homes in urban and rural areas, the total number of homes in urban and rural areas, and the number of new homes built.

With a total of 11.1 million vacancies, the United States has the most both in urban and rural areas. With over 62 million total housing units, Japan has the most, and Slovenia has the fewest, with just over 800,000. Germany has the most new dwelling developments (more than 43 million), while Australia has the fewest (just over 10.5 million).

These figures can be used to comprehend each nation's housing situation and pinpoint areas that require improvement.

Number of Housing Table



A screenshot of a database table interface showing housing statistics for five countries. The table has columns for country, vacancy_urban, vacancy_rural, total_urban, total_rural, and no_housing_const. The data is as follows:

	country [PK] character (100)	vacancy_urban integer	vacancy_rural integer	total_urban integer	total_rural integer	no_housing_const integer
1	australia	845247	194628	8805567	119097	10562800
2	germany	1097616	733372	27843642	12701675	43084122
3	japan	5241900	3246700	42849600	19557800	62420000
4	slovenia	62876	90913	438189	406467	852181
5	united states	11098000	4746000	108660000	28740000	139684000

Data Collection

Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More

Homlessness.sql ~/Documents Homlessness.sql ~/Homlessness_Database x

```
1 CREATE TABLE numberofhousing (
2     country CHAR(100) PRIMARY KEY,
3     vacancy_urban INT,
4     vacancy_rural INT,
5     total_urban INT,
6     total_rural INT,
7     no_housing_const INT
8 );
9
10 CREATE TABLE housing_price (
11     country VARCHAR(100) PRIMARY KEY,
12     rent DECIMAL(12, 2),
13     gdp_per_capita DECIMAL(12, 2)
14 );
15
16 CREATE TABLE dwelling_type (
17     country VARCHAR(100) PRIMARY KEY,
18     detached_house INT,
19     flat_apartment INT,
20     other INT
21 );
22
23 CREATE TABLE country (
24     country_id SERIAL PRIMARY KEY,
25     country_name VARCHAR(100) NOT NULL,
26     gdp DECIMAL(12, 2),
27     population INT,
28     land_area DECIMAL(10, 2)
29 );
30
31 CREATE TABLE homelessness (
32     Country VARCHAR(100) PRIMARY KEY,
33     Num_Homeless INT,
34     Homelessness_Rate DECIMAL(5, 2)
35 );
36
37 CREATE TABLE natural_disaster (
38     disaster_id INTEGER,
39     disaster_name TEXT,
40     country_name TEXT,
41     year INTEGER,
42     homeless_num_disasters REAL,
43     PRIMARY KEY (disaster_id, country_name)
44 );
```

Ln 64, Col 1 Spaces: 2 UTF-8 LF SQL ↻

Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More

Homlessness.sql

```
46 INSERT INTO natural_disaster (disaster_id, disaster_name, country_name, year, homeless_num_disasters)
47 VALUES
48     (1, 'earthquake', 'united states', 2000, 28590),
49     (1, 'earthquake', 'japan', 2000, 4119.9),
50     (2, 'flooding', 'united states', 2020, 691118),
51     (2, 'flooding', 'japan', 2000, 580),
52     (2, 'flooding', 'slovenia', 2013, 2711),
53     (3, 'storms', 'australia', 2010, 719),
54     (3, 'storms', 'japan', 1998, 2000),
55     (3, 'storms', 'united states', 1990, 26186.9);
56
57 INSERT INTO numberofhousing (country, vacancy_urban, vacancy_rural, total_urban, total_rural, no_housing_const)
58 VALUES
59     ('united states', 11098000, 4746000, 108660000, 28740000, 139684000),
60     ('japan', 5241900, 3246700, 42849600, 19557800, 62420000),
61     ('germany', 1097616, 733372, 27843642, 12701675, 43084122),
62     ('australia', 845247, 194628, 8805567, 119897, 10562800),
63     ('slovenia', 62876, 90913, 438189, 406467, 852181);
64
65 INSERT INTO housing_price (country, rent, "GDP per capita")
66 VALUES ('australia', 23.8, 60443.1),
67     ('united states', 23.4, 70248.6),
68     ('slovenia', 14.0, 29291.4),
69     ('germany', 19.1, 51203.6),
70     ('japan', 20.3, 39312.7);
71
72 INSERT INTO homelessness (country, num_homeless, homelessness_rate)
73 VALUES ('australia', 116427, 0.0048),
74     ('united states', 580466, 0.0018),
75     ('slovenia', 3799, 0.0018),
76     ('germany', 337000, 0.0041),
77     ('japan', 3992, 0.0008);
78
79
80 INSERT INTO dwelling_type (country, detached_house, flat_apartment, other)
81 VALUES ('australia', 0.716, 0.065, 0.012),
82     ('united states', 0.626, 0.263, 0.060),
83     ('slovenia', 0.666, 0.276, 0.002),
84     ('germany', 0.274, 0.562, 0.028),
85     ('japan', 0.530, 0.443, 0.001);
86
87
88 INSERT INTO country (country_id, country_name, gdp, population, land_area)
```

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Data Collection



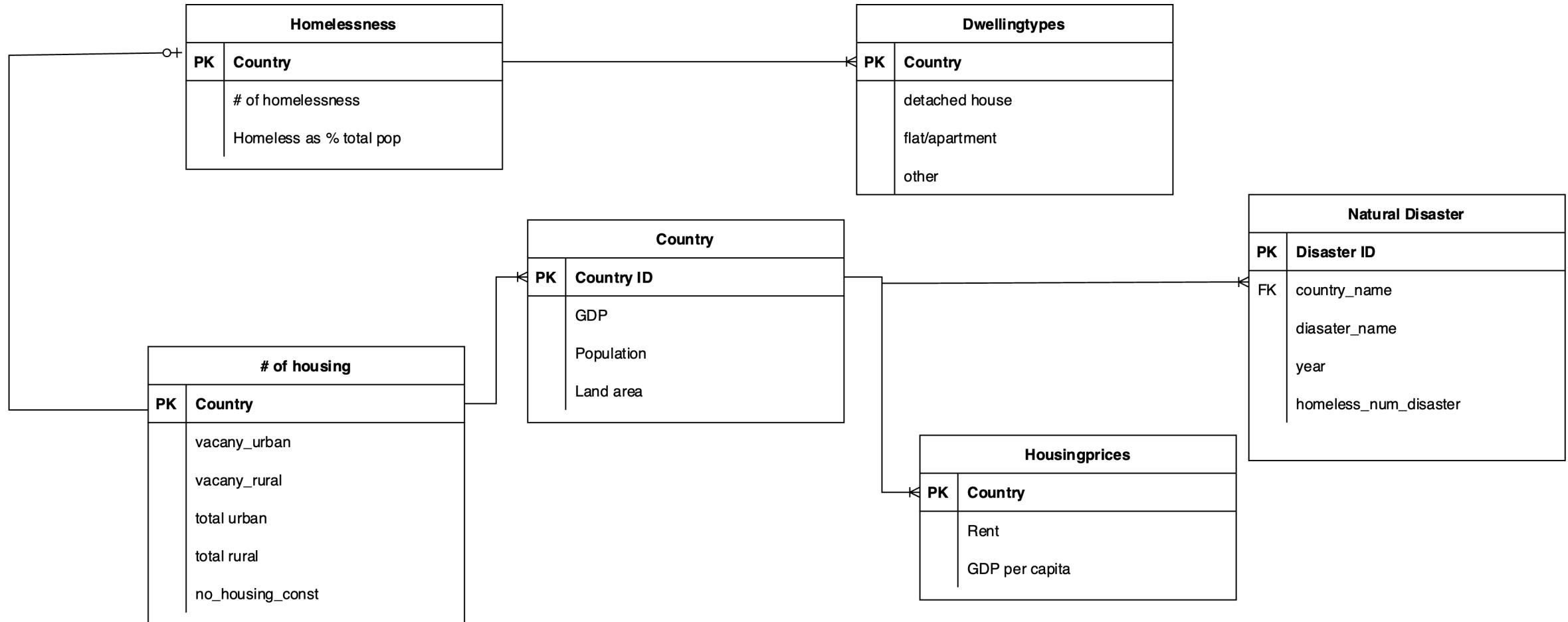
OECD Database



US Dept. of Housing and Urban Development



Homelessness Schema



Results and Future Works

- The data revealed that there is significant correlation between climate change and homelessness in various countries.
- Observing the data we have found extreme weather events like earthquakes, floods, storms led to mass displacement among the homeless population.
- Future research might examine the relationship between natural disasters and housing type, in addition to digging deeper into the connection between rental prices and homelessness rates.





Discussions and Thoughts

- Researchers could explore into how government aid and policies affect homelessness rates and the avoidance of homelessness as a result of natural disasters.
- By examining factors like income, housing affordability, and price of energy to name a few, we can improve upon current policies already in place and work towards effective solutions.

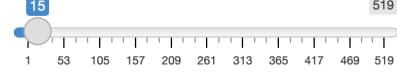
Shiny App

- <https://chizo14.shinyapps.io/Homelessness/>

Type of Disaster:

- All
- earthquake
- flooding
- storms

Enter the number of rows to display:

15519

disaster_id	disaster_name	country_name	year	homeless_num_disasters
1	earthquake	united states	2000	28590.00
1	earthquake	japan	2000	4119.90
2	flooding	united states	2020	691118.00
2	flooding	japan	2000	580.00
2	flooding	slovenia	2013	2711.00
3	storms	australia	2010	719.00
3	storms	japan	1998	2000.00
3	storms	united states	1990	26186.90

References

- Ortiz-Ospina, E., & Roser, M. (2017, February 16). *Homelessness*. Our World in Data
<https://ourworldindata.org/homelessness>