

# Modelling Healthcare Demand and Supply in New Residential Developments

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- Research not yet peer-reviewed
- Authors bear sole responsibility for the analysis and interpretations presented.



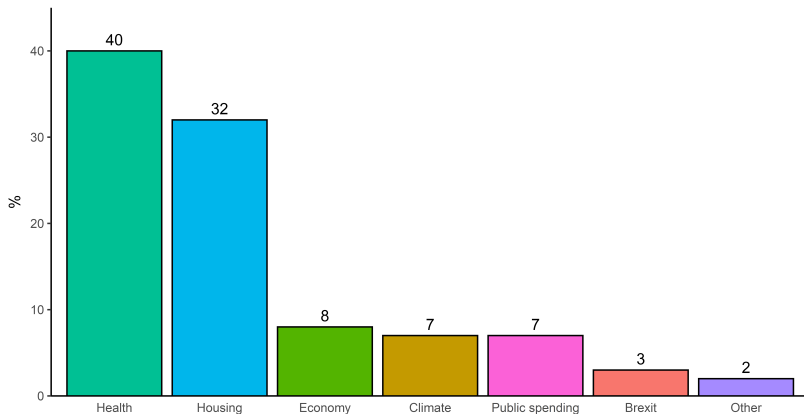
## Healthcare

- ESRI's Hippocrates Model:
  - Increasing healthcare demand driven by demographic changes
- Adequate workforce/infrastructure required
- Population-based resource allocation, Health Regions



## Housing

- New residential developments increasing demand in local areas
- Lower healthcare supply in fastest growing regions
- Housing impacts health outcomes
  - Integrating housing and healthcare planning improve healthcare access and population health



Source: Irish Times/Ipsos MRBI opinion poll, General Election 2020.

**Figure 1:** *“Which of the following issues will have the most influence on which party or candidate you vote for in the upcoming election?”*

## Key Objectives of Research Project:

1. Profile the relationship between housing tenure, health outcomes, and public healthcare coverage in Ireland
  - Humes H., Barrett M., Walsh B. (2023) "Housing tenure, health and public healthcare coverage in Ireland"
2. Develop Housing and Health Planning (HHP) Model
  - Produce estimates of potential healthcare demand implications of new housing developments
  - Estimate commensurate supply metrics (e.g., WTEs or bed days) to meet this new demand
3. Provide evidence on the integration of housing and healthcare planning in Ireland

# Housing and Health Planning (HHP) Model

HHP model is a cell-based macrosimulation model built with highly-granular administrative and survey data inputs. 3 key stages

## 1. Healthcare Activity Profile:

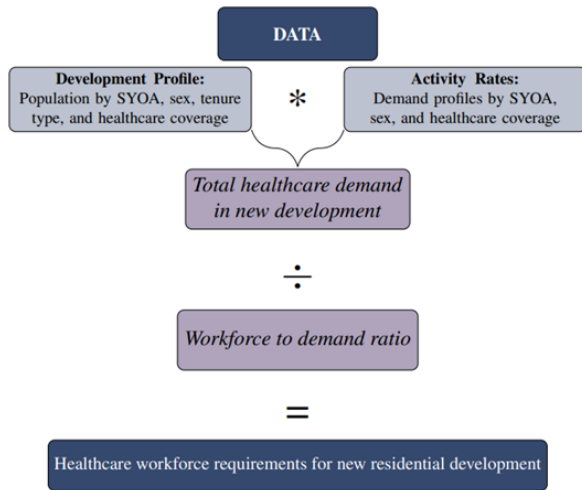
- Calculates healthcare service activity rates disaggregated by age, sex, Medical Card/GPVC status
- **Data:** HIPE, HIS, TILDA, HSE

## 2. Development Profile:

- Estimates a new development's profile
- **Data:** Survey of Income and Living Standards (EU-SILC), CSO

## 3. Healthcare Supply:

- Total activity in each service divided by a demand-supply ratio
- E.g., Number of healthcare workers (WTEs) or hospital bed days
- Collins C., Homeniuk R. (2021) "How many general practice consultations occur in Ireland annually?"



**Figure 2:** Diagrammatic representation of the operation of the HHP model



Model currently covers a small number of healthcare services

- Primary Care
  - GP visits
  - Practice Nurse visits
- Public Acute Hospitals
  - Emergency Department admissions
  - Emergency Inpatient admissions
  - Elective Inpatient admissions
  - Day case admissions

Both demand and supply calculated on a **per annum** basis

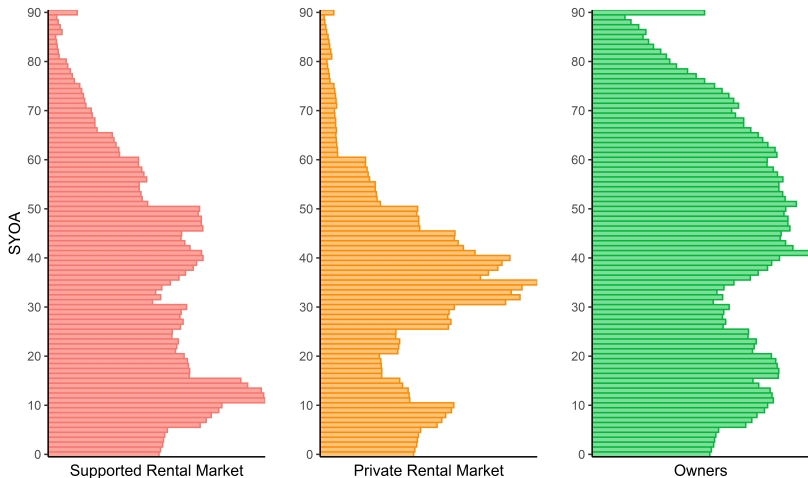
**Table 1:** Tenure compositions in benchmark developments

BENCHMARK	Supported Renters   Private Renters   Owners		
(a) Housing for All Dev	30%	20%	50%
(b) Public Housing Dev.	80%	10%	10%
(c) Private Housing Dev.	10%	40%	50%

- Can vary size of new development
  - Small-scale (50 houses) to new town (5000 houses) developments
- Varying by tenure composition will also vary age/sex & public healthcare coverage composition of development

# HHP Model Input Results

# Age Structures Across Tenure Types



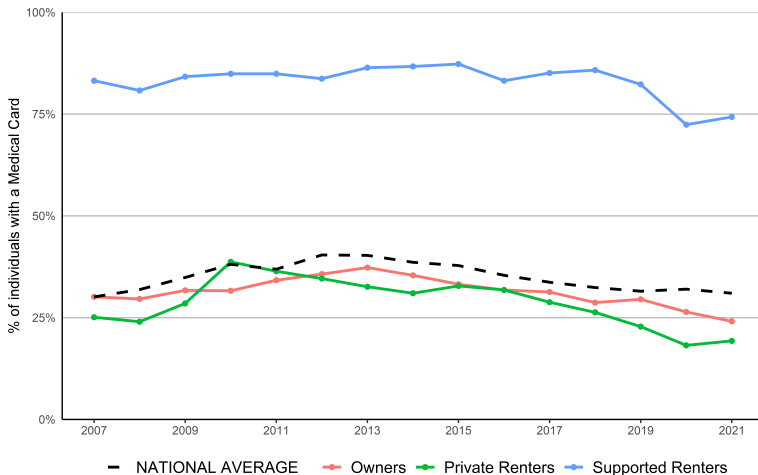
**Figure 3:** *Population by Age in each Tenure Type*

**Table 2:** Average Household Size by Tenure Type

Tenure Type	Average Household Size
<i>Owners</i>	2.65
<i>Private Renters</i>	2.43
<i>Supported Renters</i>	2.57
<i>National</i>	2.60

Source: EU-SILC 2021.

# Medical Card Coverage by Tenure



**Figure 4:** *Percentage of individuals with a Medical Card by tenure type, 2007-2021 (aged 18+)*

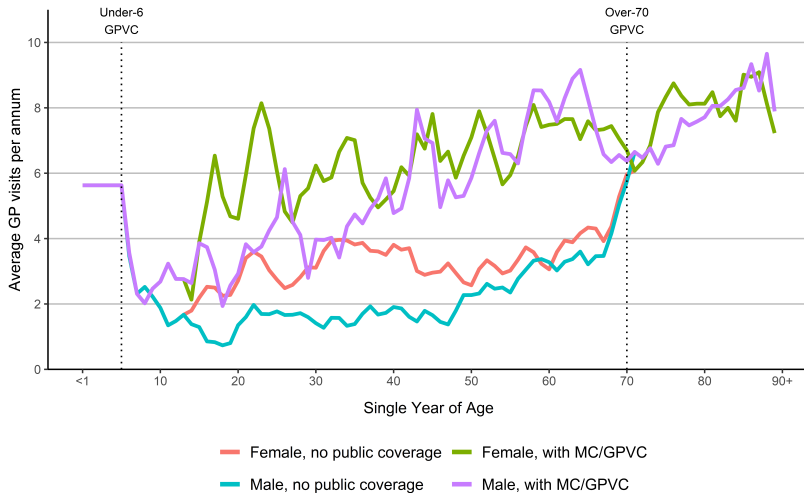
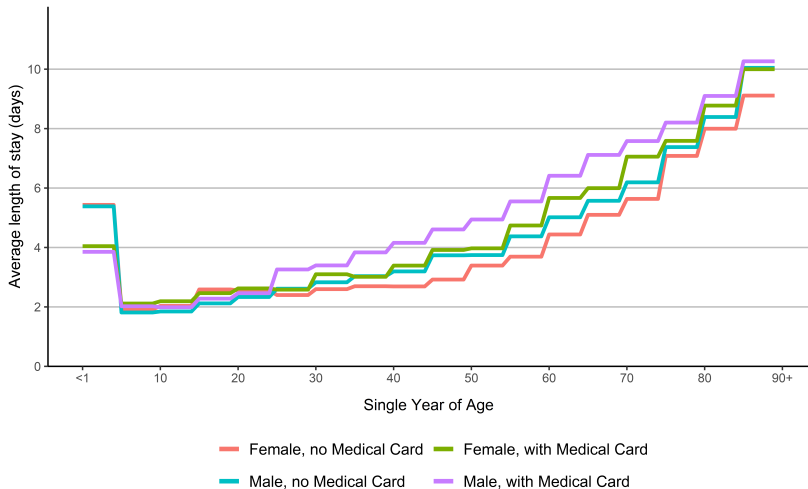


Figure 5: GP visits by sex, age & public healthcare coverage



**Figure 6:** *IP bed days visits by sex, age & public healthcare coverage*



# HHP Model Estimates

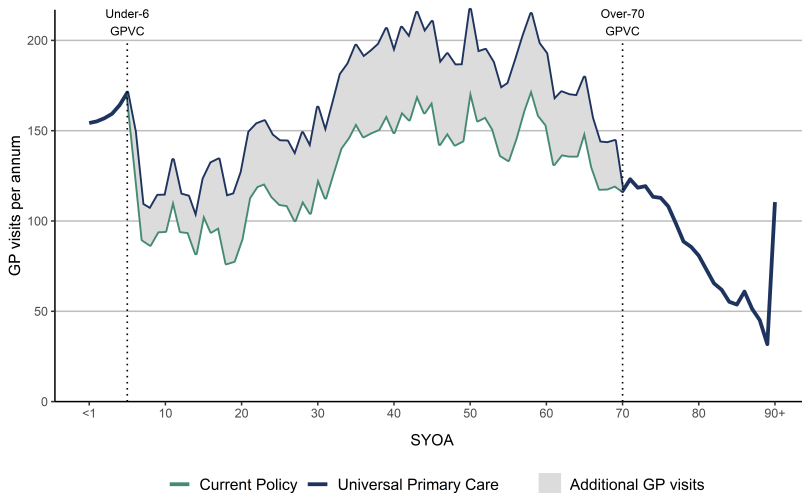
**Table 3:** Comparison of GP demand and supply in benchmark development types

Parameters	(a) HFA	(b) Public Housing	(c) Private Housing
Development Size	1,000	1,000	1,000
Total Population	2,580	2,564	2,554
Supported Renter %	30	80	10
Private Renter %	20	10	40
Owner %	50	10	50
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<b>Total GP Visits</b>	10,979	12,014	10,514
<b>GP WTEs required</b>	1.50	1.64	1.43

**Table 4:** Comparison of total inpatient admissions, bed days, and required beds in three benchmark development types

Parameters	(a) HFA	(b) Public Housing	(c) Private Housing
Development Size	1,000	1,000	1,000
Total Population	2,580	2,564	2,554
Supported Renter %	30	80	10
Private Renter %	20	10	40
Owner %	50	10	50
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<b>Total IP Admissions</b>	296	291	278
<b>Bed days</b>	1783	1539	1687
<b>Beds required</b>	4.89	4.22	4.55

# Healthcare Policy Changes



**Figure 7:** *GP visits, Universal Primary Care example by age*

**Table 5:** Implications for GP demand and supply in a 1000-unit HFA development with and without universal primary care

Parameters	(a) Current Policy	(b) Universal Primary Care
Development Size	1,000	1,000
Total Population	2,580	2,580
Supported Renter %	30	30
Private Renter %	20	20
Owner %	50	50
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<b>Total GP Visits</b>	<b>10,979</b>	<b>13,254</b>
<b>GP WTEs required</b>	<b>1.50</b>	<b>1.80</b>

- Integrating healthcare and housing planning is essential
- Scope to develop guidance on healthcare demand and supply requirements
- Results reflect HHP 1.0.
- Future iterations:
  - Expansion of health and social care services
  - Projected future demand/supply
  - Infrastructure (e.g., primary care centres)
  - Modelling approach allows for applications to other local services (e.g., childcare, education) if data are available