An Analysis of the Effects on Irish Hospital Care of the Supply of Care Inside and Outside the Hospital

DATE
24/09/2019

VENUE
ESRI

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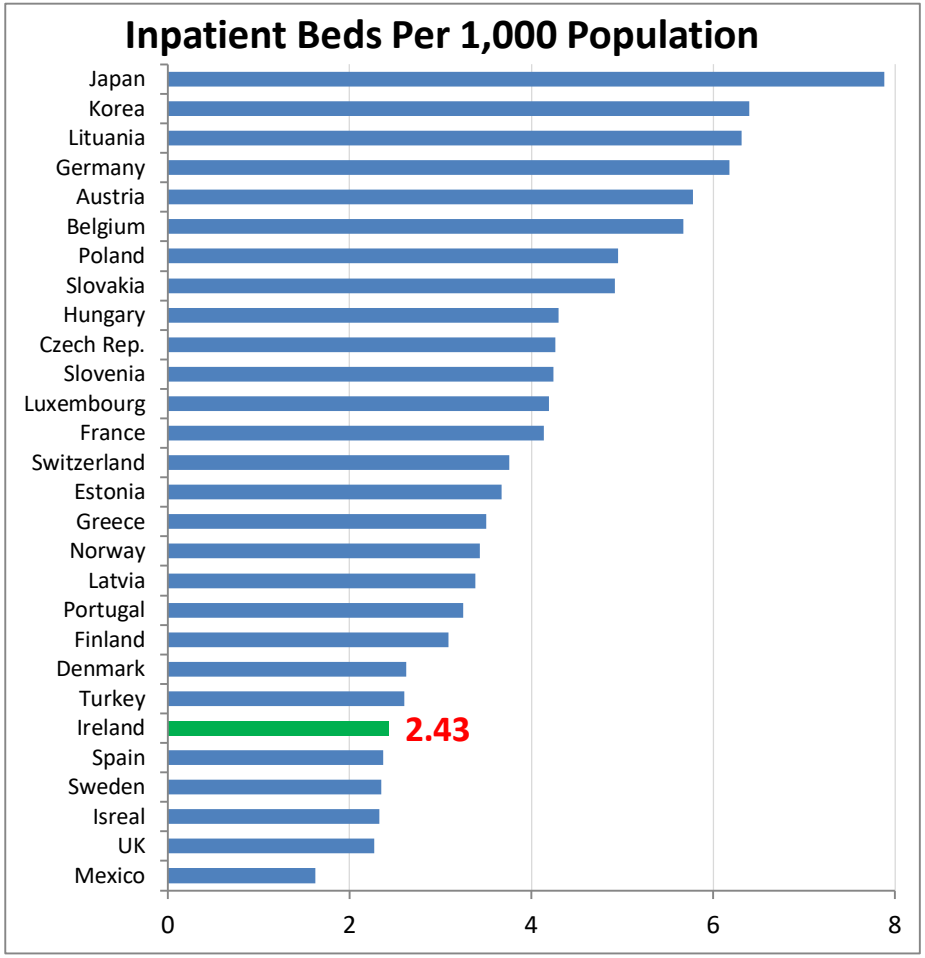
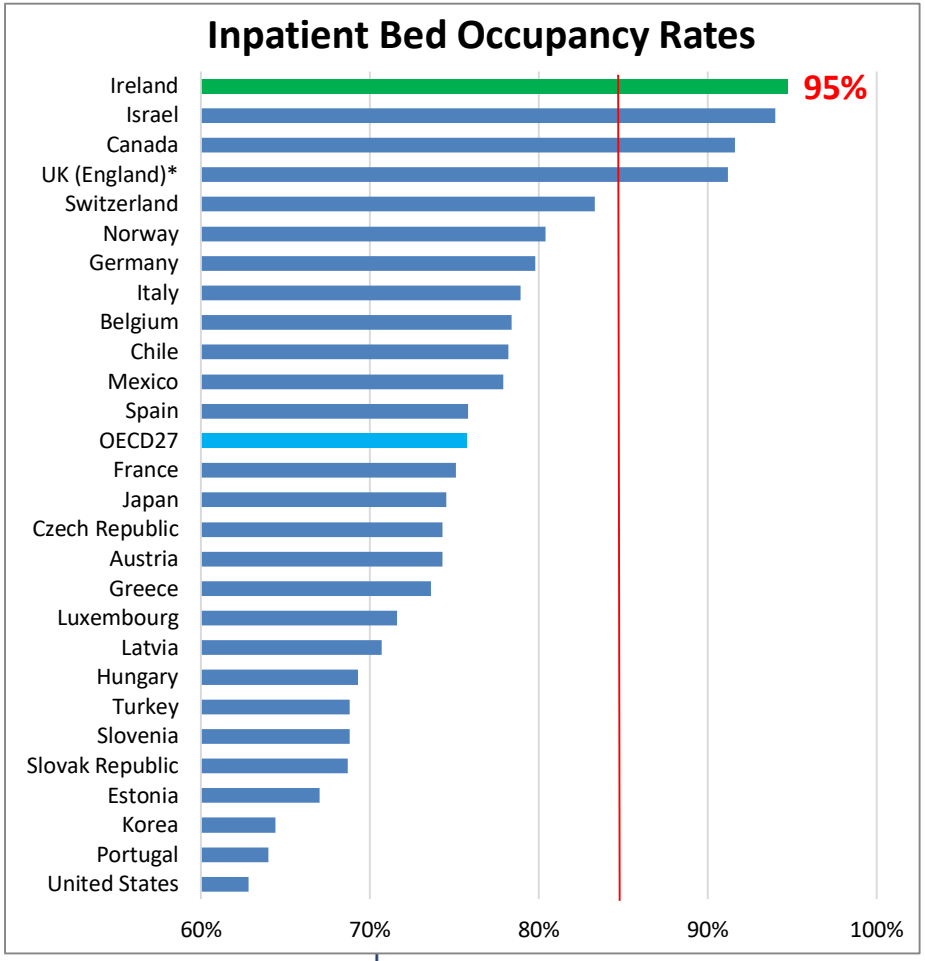
Aim, Context & Motivation

- Report 1
  - Geographic profile of non-acute care
- Report 2
  - Analyse how supply of acute & non-acute care affects utilisation of hospital care
    - Provide an overview of changes to the public hospital sector in recent years (Reconfiguration)
    - Examine association of hospital bed capacity and inpatient length of stay
    - Examine association of long-term care (home care and long-term residential care (LTRC)) and inpatient length of stay
  - Recommendations for improving resource allocation in the Irish health and social care system

Acute Hospital Capacity

- Public hospitals in Ireland experiencing significant capacity issues

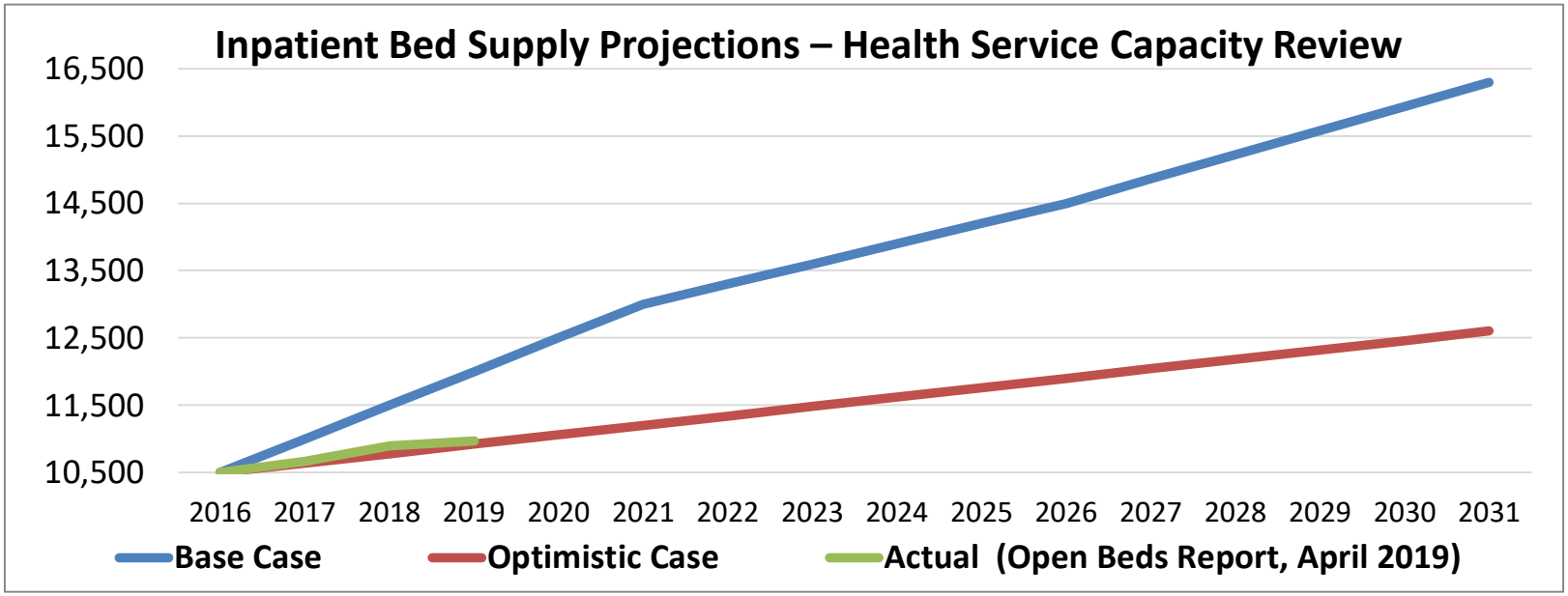




Delayed Discharges

- High occupancy rates also a consequence of inability to access community and Delayed Discharges
- 1/16 inpatient beds filled by patients medically cleared for discharge
- In 2017 there were 205,047 inpatient bed days from delayed discharge
  - Almost all were aged 65 years and over
  - 15 per cent were awaiting home care
  - 30 per cent were awaiting LTRC
- Delayed discharge prevents patients returning home, receive care in most appropriate setting, prevents bed being used for other services such as elective care

Medium-Term Planning



- *Sláintecare, HS Capacity Review, National Development Plan* make assumptions on substituting care from 'hospital-centric' setting
  - Optimistic case based on substitution assumptions and large investments in non-acute care supply and workforce
  - Difference between Base and Optimistic equivalent to **7 St Vincent's Hospitals**

Can Long-Term Care Substitute for Hospital Care?

- This report focused on acute care and long-term care (Home Care and LTRC beds):
  1. Older patients use a large proportion of health and social care services
  2. Almost all delayed discharges aged 65+, with half awaiting long-term care services
  3. International evidence provided us with a modelling methodology template to examine substitution of acute and long-term care services
  4. Data Availability! Similar analyses not possible for other services examined in Smith et al. (2019)

Data: 2012 - 2015

Public Hospitals – Hospital In-Patient Enquiry (HIPE) Data

- Captures 99%+ of public hospital discharges. Info on: date of admission/discharge; disease classification; procedure; age; sex; DRG.
- Residence ID (county, Dublin postcode) of each discharge
- BIU HSE information on hospital bed supply by month ('push' factor)

Home Care – HSE Social Care Division Data

- Number of HH hours and HCPs by LHO by month

Long-Term Residential Care – HIQA Bed Register + Monitoring & Compliance Reports; Long-Stay Activity Statistics, Nursing Homes Ireland

- Comprehensive list of LTRC beds by 28 counties

Population Data – ESRI Estimates

- Broken down by county, age, sex

Outcome Variables

Hospital Use

- Emergency Inpatient Length of Stay (LOS)
  - Due to lack of Individual Health Identifier (IHI), difficult to examine overall hospital use, readmissions, patient outcomes
  - Due to lack of data on private hospitals, difficult to examine elective LOS
  - >300,000 discharges arriving from home

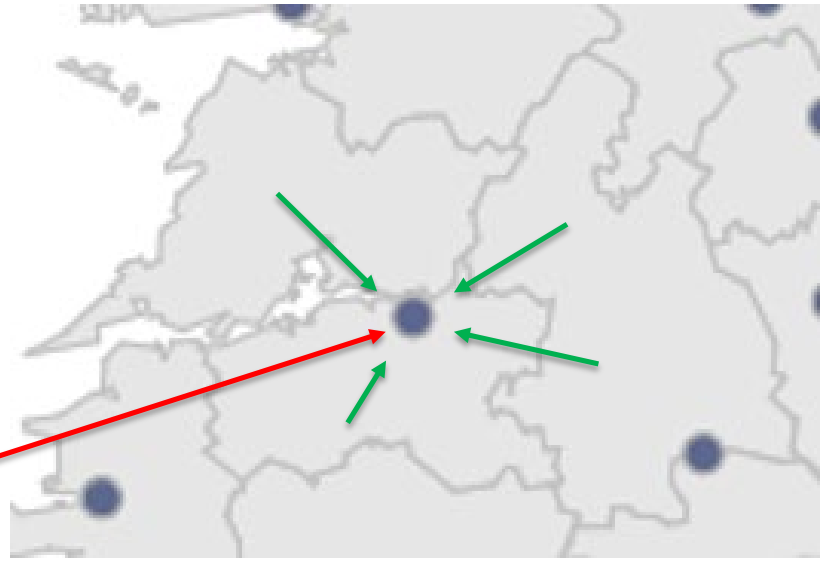
- Delayed Discharges
  - Delayed Discharges not captured in HIPE data → long LOS (90^{th} percentile) used as a proxy for delayed discharges

Supply Variables of Interest

- **Home Care**: County-Level Home Care Hours per capita aged 65+
- **LTRC**: County-Level LTRC beds per capita aged 65+
  - Beds included: Long-stay beds for elderly; limited-stay or intermediate care beds; respite beds; rehab beds; condition-specific beds (dementia care beds)

- **Modelling methodology**
  - Linear and negative binomial regressions used to examine associations between long-term care supply and average hospital LOS
  - Unconditional Quantile Regressions used to examine associations between long-term care supply for longer LOS (delayed discharges)
  - Are effects larger for some groups (i.e. delayed discharges; stroke, hip fracture, Alzheimer's/dementia patients; females, sicker patients)

Identifying Long-Term Care Supply Effects



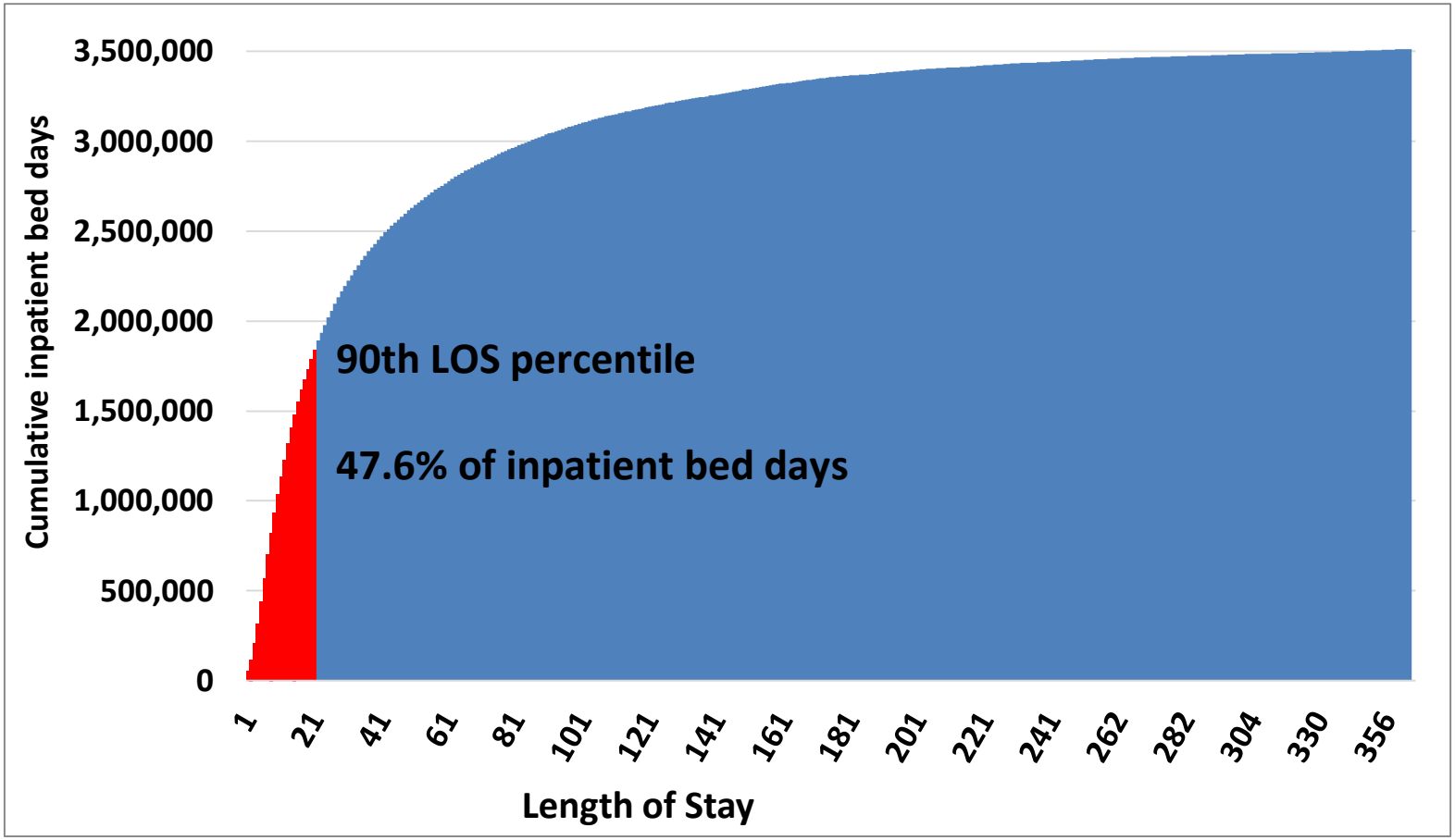
- Strategy takes advantage of patients from different counties using the same hospital
  - UHL patients from Clare, Lim., Tipp N, Tipp S
- Patients have different levels of long-term care supply depending upon their address & year
- Hospital & patient-level factors controlled for

DESCRIPTIVE RESULTS

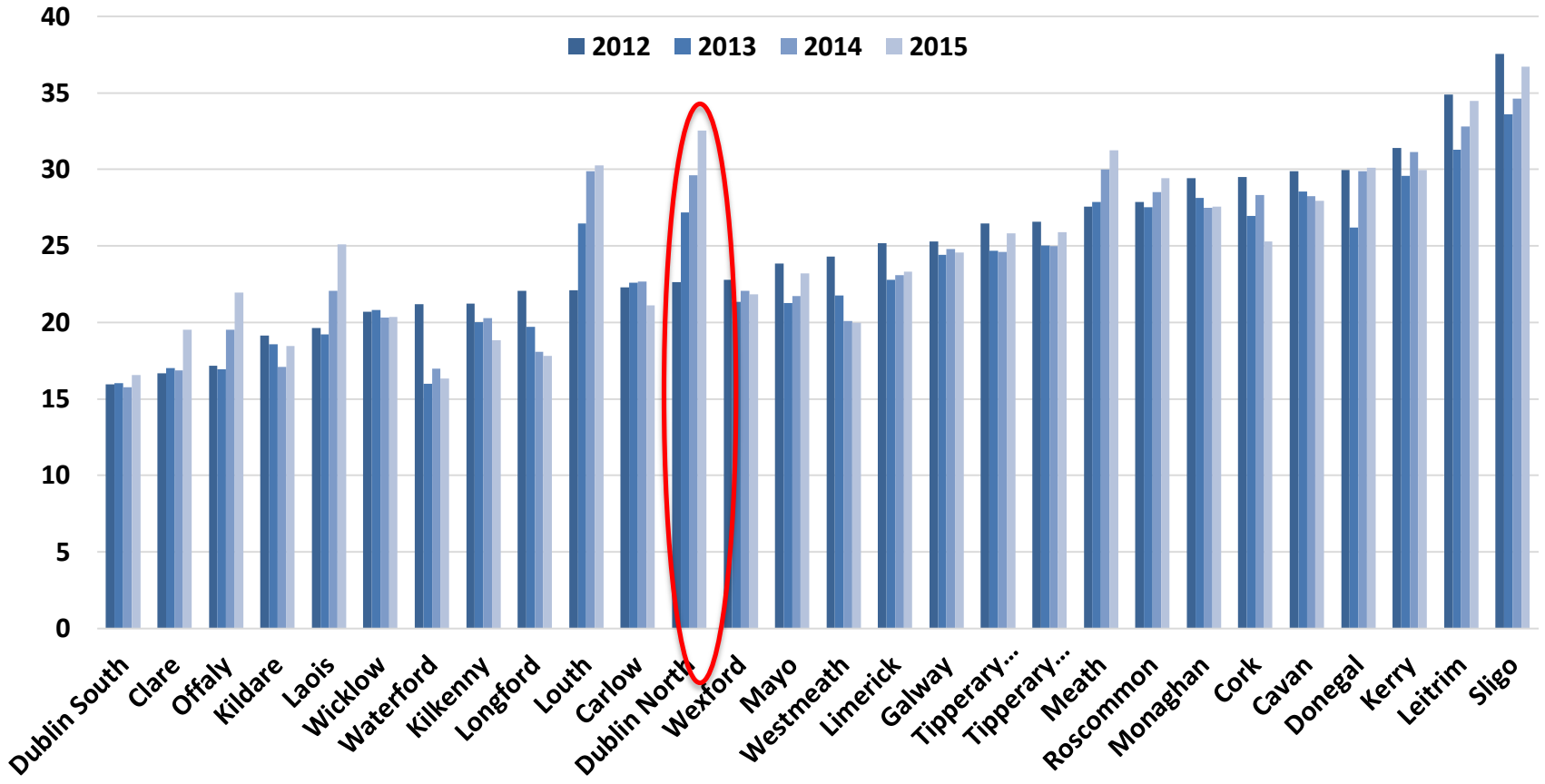
Descriptive Statistics: 2012-2015

	Number of discharges
Emergency inpatient discharges	333,928
Length of stay	10.51 days
Age	77.36 years
Medical card	0.78
Number of diagnoses	5.27
Discharge destination	
Home	0.80
Long stay	0.11
Transfer/Other	0.18
Length of stay by discharge Destination	
Home	8.00 days
Long stay	26.28 days
Transfer/Other	13.70 days
Stroke	0.03
Hip fracture	0.03
Alzheimer's/dementia	0.05

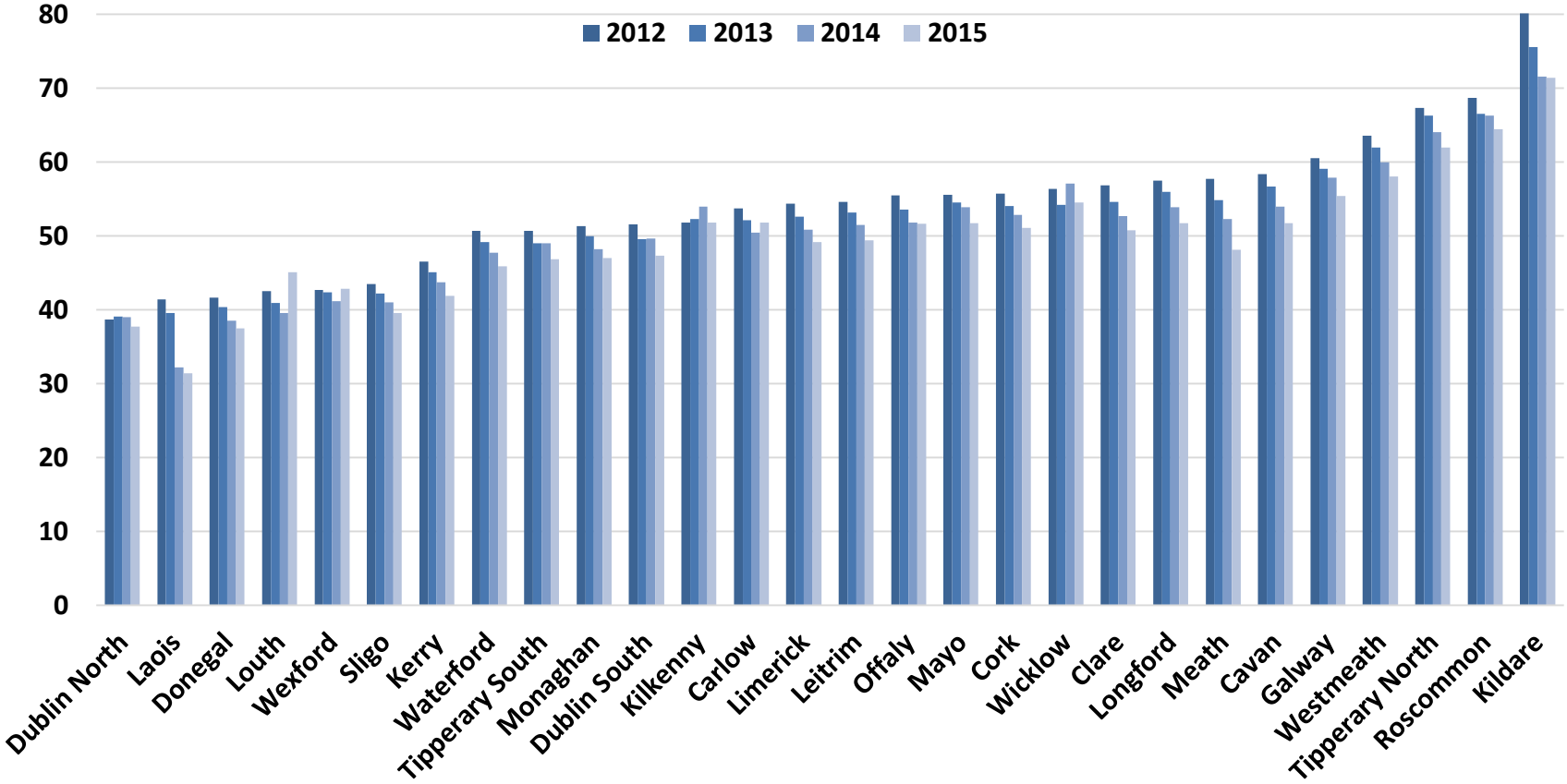
Length of Stay and Inpatient Bed Days



Annual Home Care Hours per capita aged 65+



Annual LTRC beds per capita aged 65+



SUBSTITUTION RESULTS

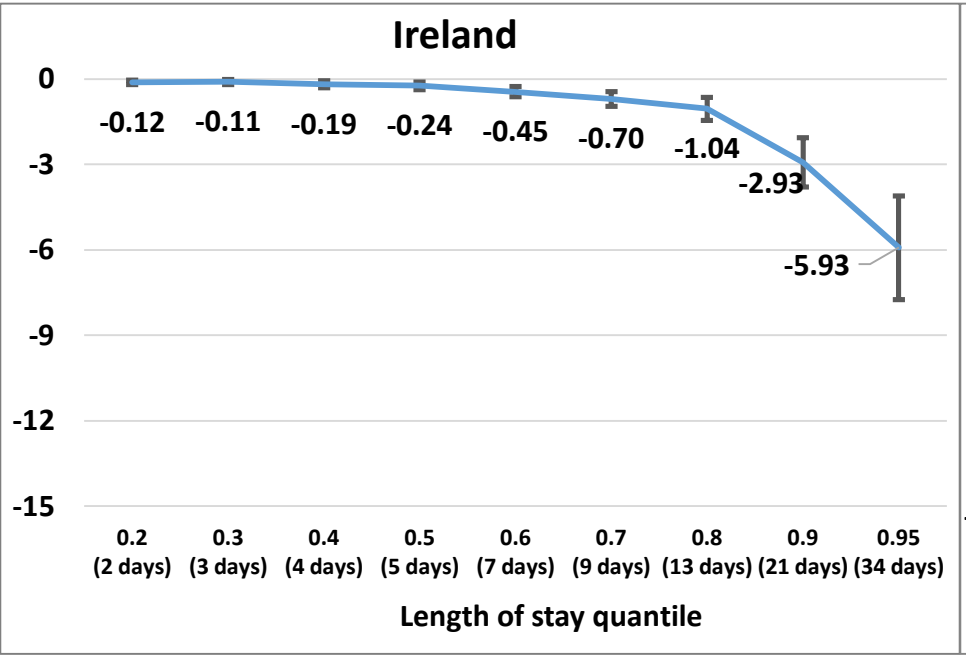
Home Care – Average LOS

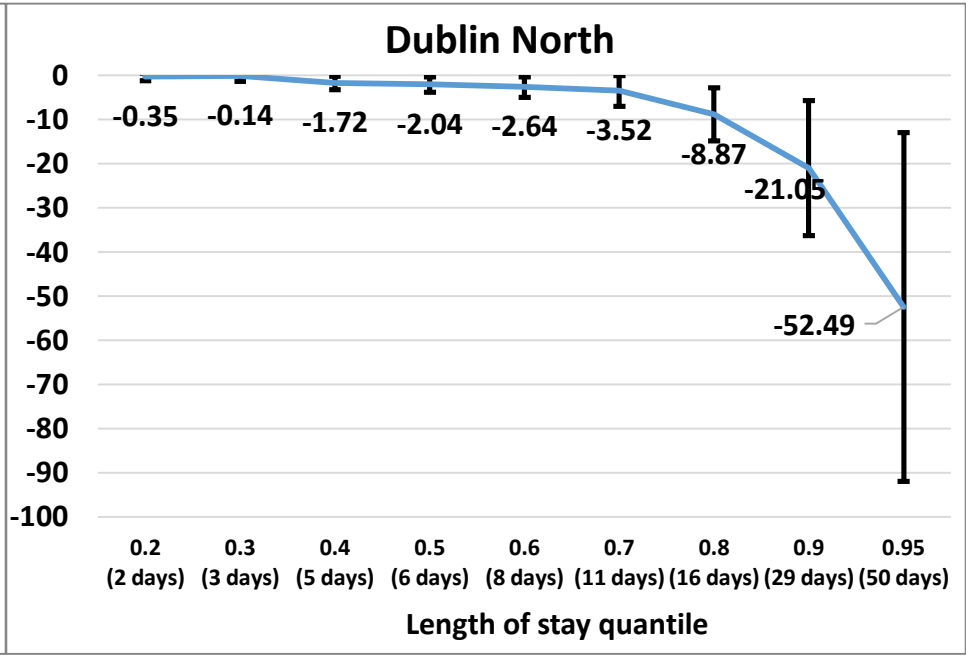
	All 65+	Dublin North*	Stroke	Hip Fracture
Average LOS	-1.75%	-2.7%	-2.7%	-1.6%
Illustration of effects grossed-up to national level				
Bed Days	-14,700	-40,000*		
Beds	-40	-110*		

*** Grossed to National Value**

- Results interpreted in terms of a 10% increase in Home Care Hours (1.5m hours)
- Not all patients amenable to home care to reduce their LOS

Home Care – Delayed Discharges





- Results interpreted in terms of a 10% increase in Home Care Hours (1.5m hours)
- **Dublin North:** 10% increase in Home Care associated with 2 days less in hospital in 90th percentile

Emergency Inpatient Length of Stay Quantiles: 2012 & 2015

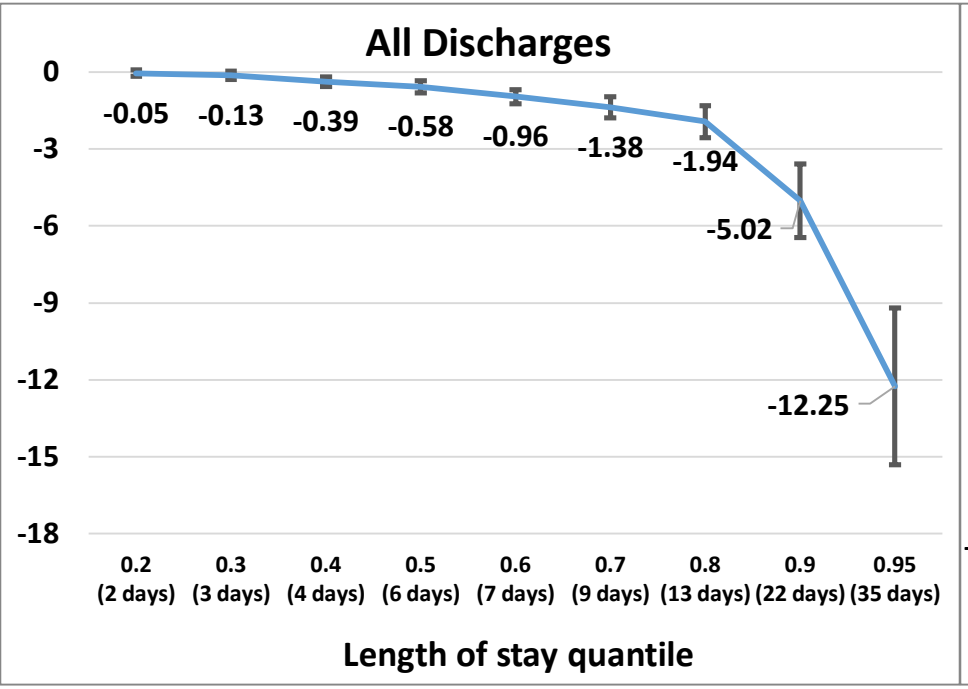
	Ireland		Dublin North	
Quantile	2012 (n=77,452)	2015 (n=76,433)	2012 (n=9,117)	2015 (n=9,098)
<20th	n/a	n/a	n/a	n/a
20th	2 days	2 days	2 days	2 days
30th	3	3	3	3
40th	4	4	5	5
50th	5	6	6	6
60th	7	7	8	8
70th	9	9	11	11
80th	12	13	17	16
90th	21	22	31	28
95th	33	35	56	45

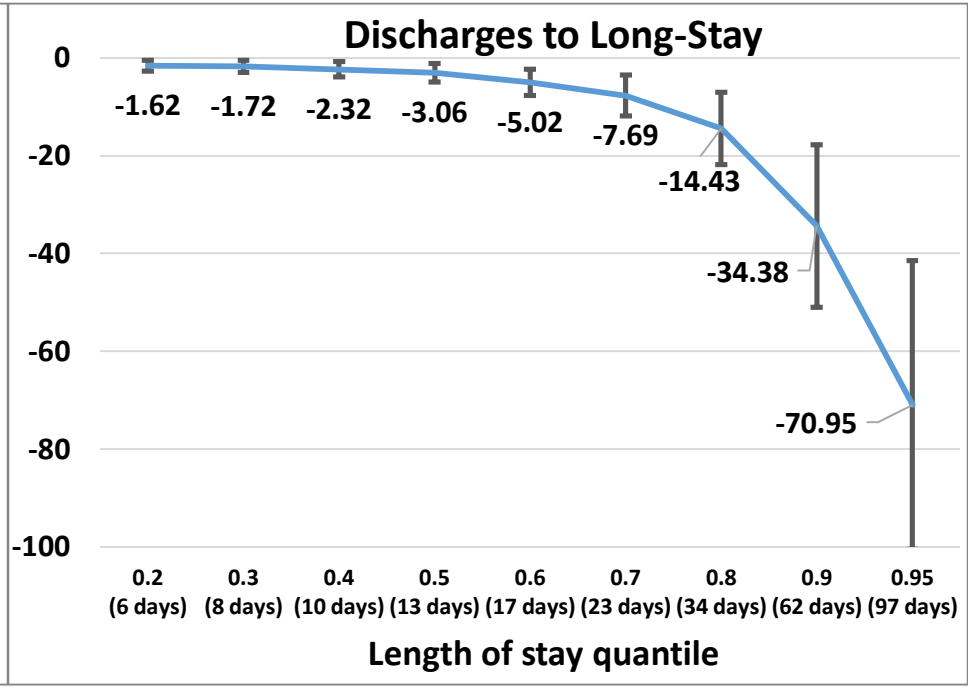
LTRC Beds – Average LOS

	All 65+	Long-Stay Discharge	Hip Fracture	Alzheimer's/ Dementia 85+
Average LOS	-2.2%	-3.9%	-2.5%	-5%
Illustration of effects grossed-up to national level				
Bed Days	-19,000	-9,720		
Beds	-53	-27		

- Results interpreted in terms of a 10% increase in LTRC beds (2,965 beds)
- Not all patients amenable to LTRC to reduce their LOS

LTRC Beds – Delayed Discharges





- Results interpreted in terms of a 10% increase in LTRC beds (2,965 beds)
- **Discharged to LTRC**: 10% increase in LTRC associated with 3.3 days less in hospital in 90th percentile

Overview of Report 2 Results

- Home Care and LTRC supply associated with shorter inpatient LOS for older patients admitted from home
- Results larger for those groups most amenable to LTC
  - Stoke, Hip Fracture, Delayed Discharges, Discharge to LTRC
- Other analyses from the report highlight the importance of hospital bed capacity, and imply that home care supply may also reduce discharge to LTRC facility – *further research required*
- **NB:** while increases in home care and LTRC are required, so too is additional hospital capacity

POLICY RECOMMENDATIONS FOR RESOURCE ALLOCATION

Resource Allocation Mechanism

- Many of the recommendations in Chapter 8 of Report 2 build on ideas put forward previously
  - "Resource allocation and financing in the health sector" (Brick et al., 2010)
  - "Towards the development of a resource allocation model for primary, continuing and community care in the health services" (Vega et al., 2010)
    - *there is no single correct way to allocate resources, and there is no perfect model*

- Better resource planning requires:
  1. *Data*
  2. *Substitution and Integration*
  3. *Workforce Planning*
  4. *Equity across Geographic Regions*
  5. *Planning for Demographic Change*

Health System Data

- Gathering appropriate data and undertaking necessary research vital to make informed decisions about how best to allocate resources
- Current data, and data infrastructure, in Ireland makes efficient allocation of resources difficult
- Lack of information on demand, supply, and unit-costs

- Considerable data gaps in private health and social care
  - Private Hospitals provide 31% of day cases, 15% if inpatient bed days
    - Little information on patients, resources, workforce, salaries, outcomes
  - Private physios provide over 50% of community physio supply
  - Publicly-funded Home Care and LTRC now largely privately provided
    - >75% LTRC beds in private facilities
    - >55% home care hours provided by non-HSE staff

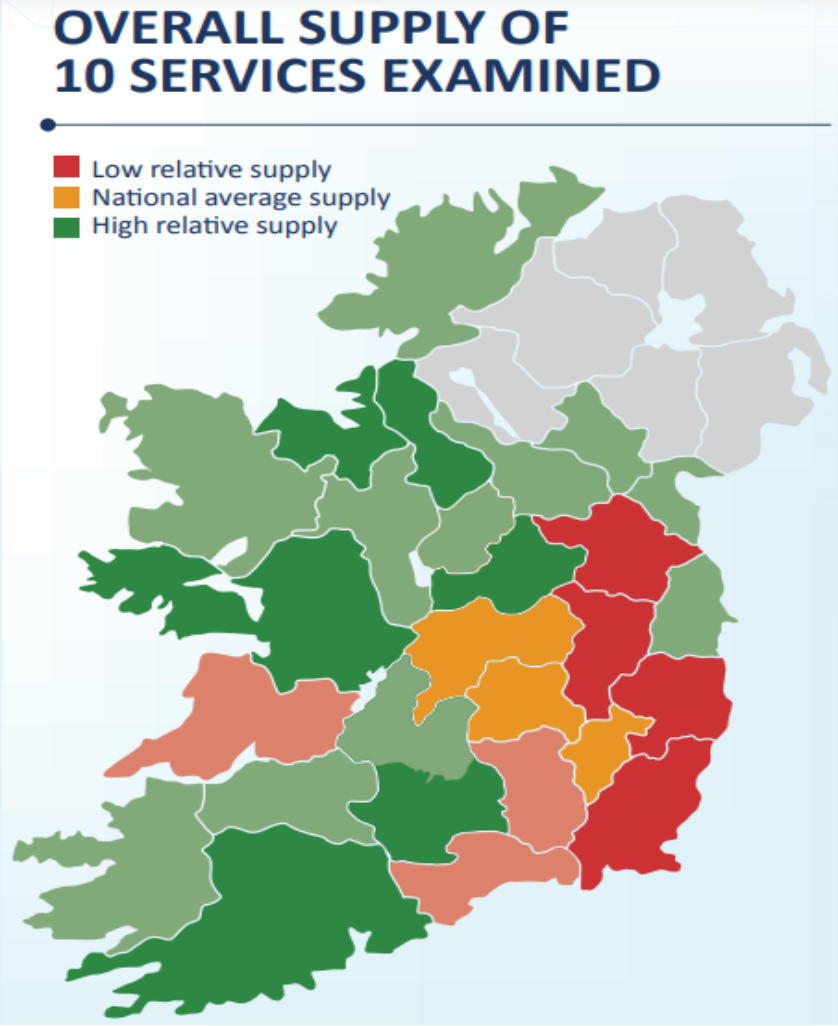
Substitution and Integration

- Health and social care should be provided at the most appropriate level, at lowest level of complexity, and as close to home as possible
- Lack of IHI makes it difficult to follow patients across the services
- Regional Integrated Care Organisations (RICOs) should provide the template to better integrate care across services
  - **NB**: Activity-Based Funding being rolled out across hospitals. Without integration of services, are hospitals being punished for poor social care supply in their area?
- Further research on substitution across services (GP care, community therapy) required

Workforce Planning

- The provision of quality and efficient healthcare services depends upon having workforce numbers at the national and regional levels
- Planning requires understanding of current workforce, the ability to recruit and retain workers and the necessary level of newly trained personnel to meet future demand requirements
- Unrealistic assumptions about the ability to substitute care into the community may lead to further resourcing issues in acute system
- **Information on private providers also required**: both public and private providers *'fishing from the same pool'* of talent

Equity across Geographic Regions



- Lack of allocation mechanism has resulted in regional inequalities in supply
- Supply differences not related to population need differences
- Allocation mechanism would allow for supply to follow population increases, age difference, disability, deprivation etc. (Sláintecare)

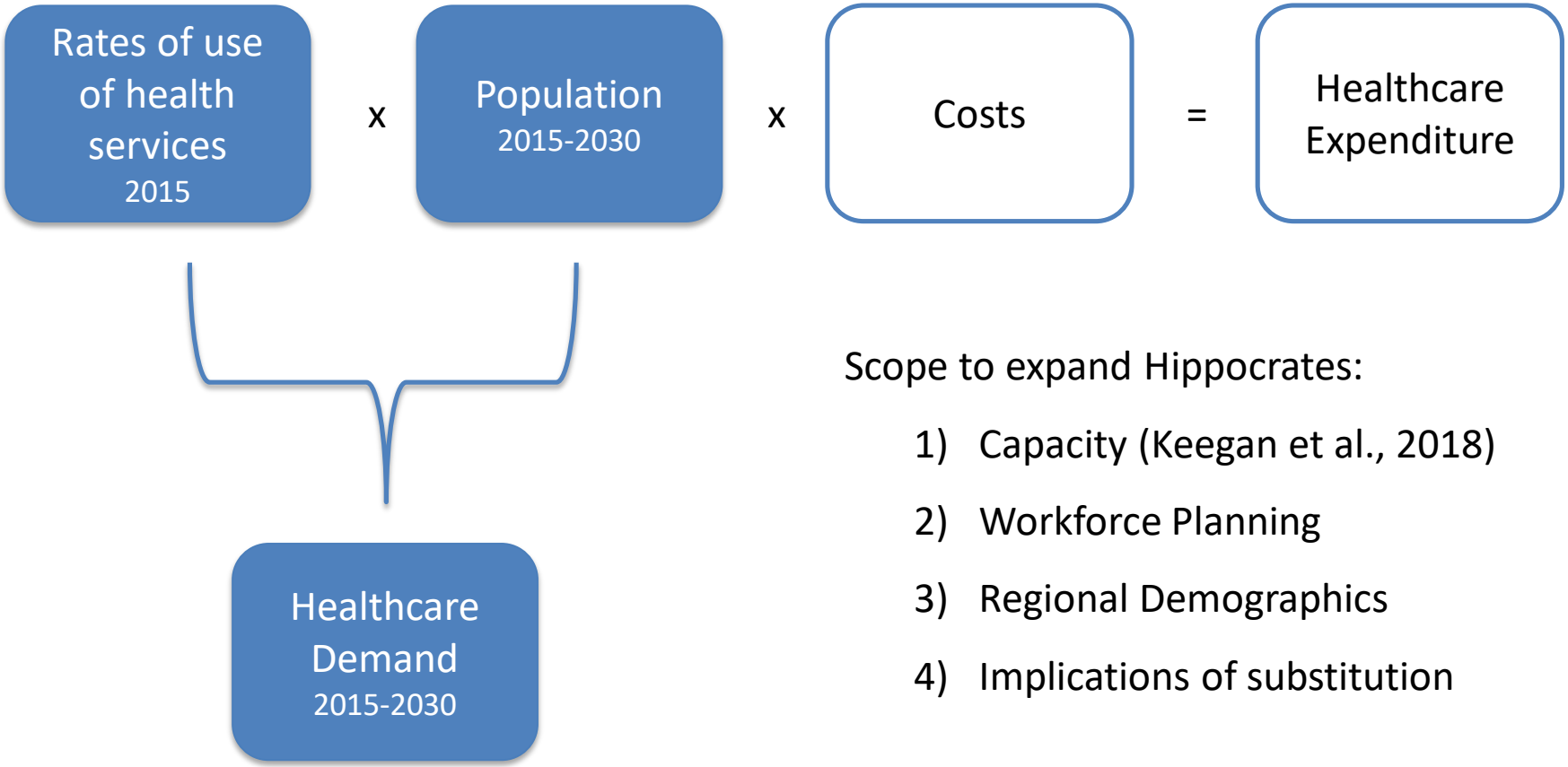
Demographic Change

- Population is growing, especially at older ages
  - Economic health and population health has improved
  - Between 2015-2030 overall pop. to increase by up to 1.08millon
  - Population aged 65+ to increase by up to 63%

- Ensuring those areas and population groups that will see largest increase are matched with sufficient health and social care supply
  - Health and social care supply should be matched with population need

ESRI HIPPOCRATES Model (Wren et al., 2017)

Macro-simulation model, single year of age, M/F



Scope to expand Hippocrates:

1) Capacity (Keegan et al., 2018)
2) Workforce Planning
3) Regional Demographics
4) Implications of substitution

THANK YOU