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# Impact of **Integrated Home Health Care Program** on Homebound Patients' Healthcare Utilization in Taiwan -- A Retrospective Cohort Study

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Sep 22, 2023

# Outline

- Introduction to integrated home health care in Taiwan
- Method
- Result
- Conclusion

# Introduction

- Home health care services are important for population with severe **disability**.
- The population grows older, **the rates of potentially disabling diseases increase**.
- **Disabled people**, defined by the International Classification of Functioning, Disability and Health, are people who have body function or structure impairment and limitations or restrictions for daily activities.
- According to the data from WHO, approximately **15%** of the world's population have suffered from some forms of disability.
- There are unmet health care needs of people with disabilities because of their **less access to healthcare services**. Besides, providing optimal care for elderly adults with multiple chronic diseases or comorbidities is challenging.

# Introduction

With life expectancy continuing to rise,  
the elderly population will continue to increase

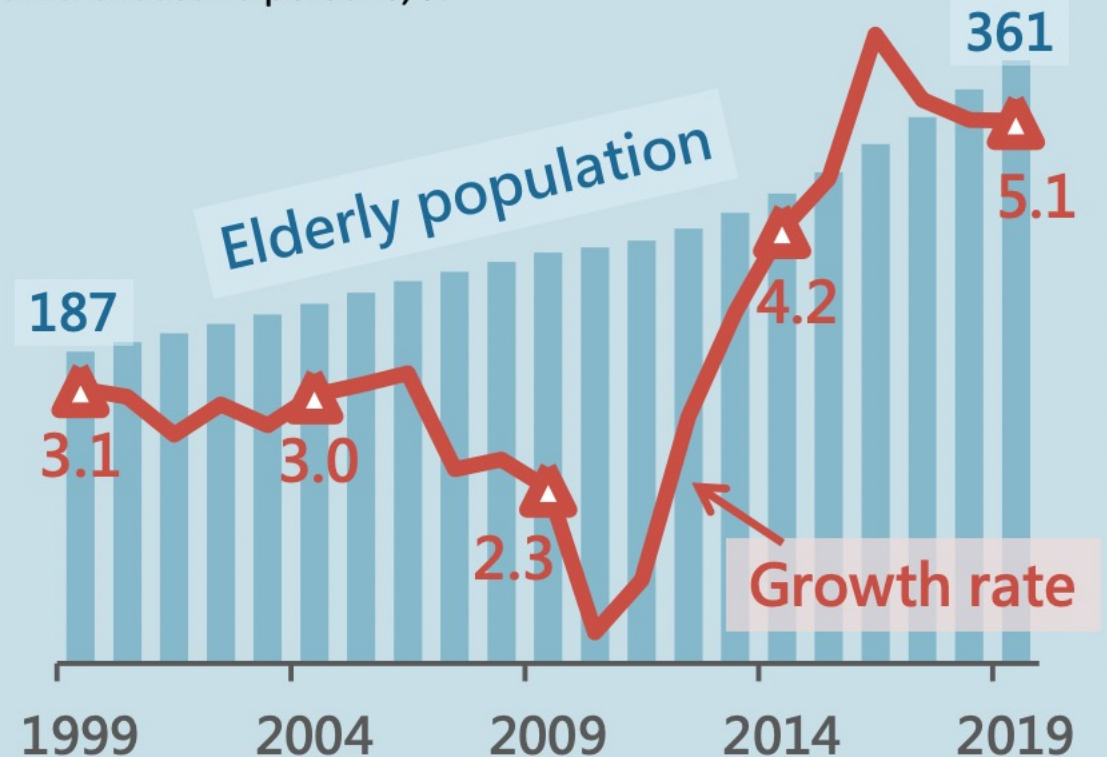
## Male & female life expectancy

Unit: years



## Elderly population & growth rate

Unit: thousand persons, %



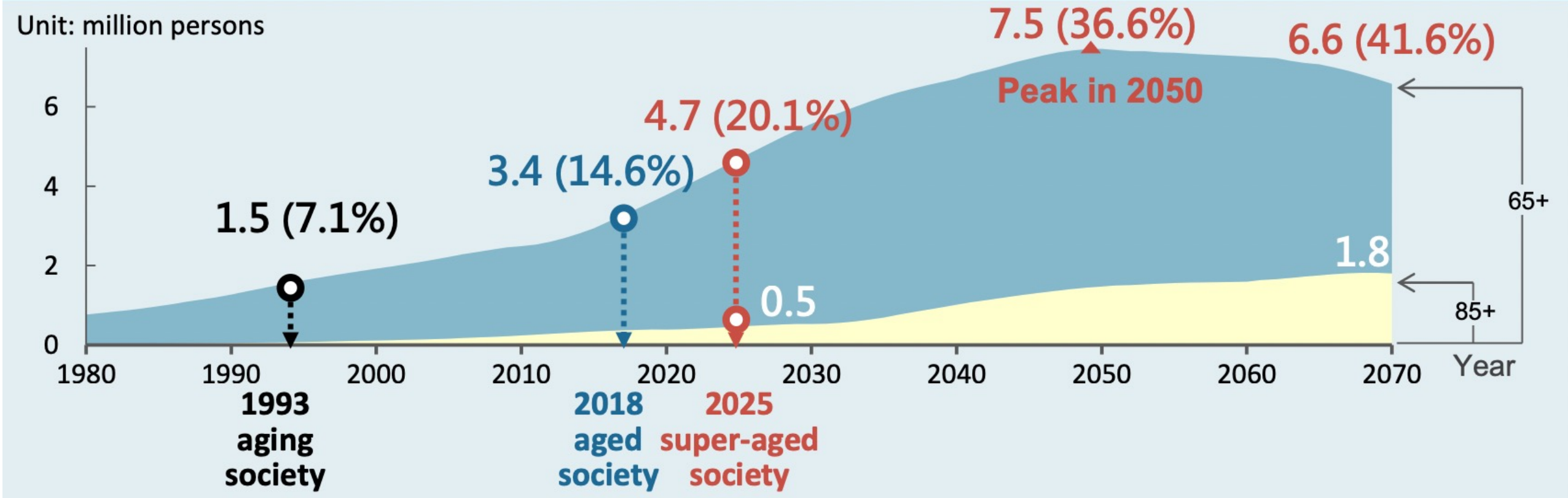
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# Introduction

## Taiwan to be a super-aged society by 2025

### The population aged 65 years and older



Note: The number in ( ) means proportion of population aged 65+. This graph after 2020 shows the results of medium-variant projections

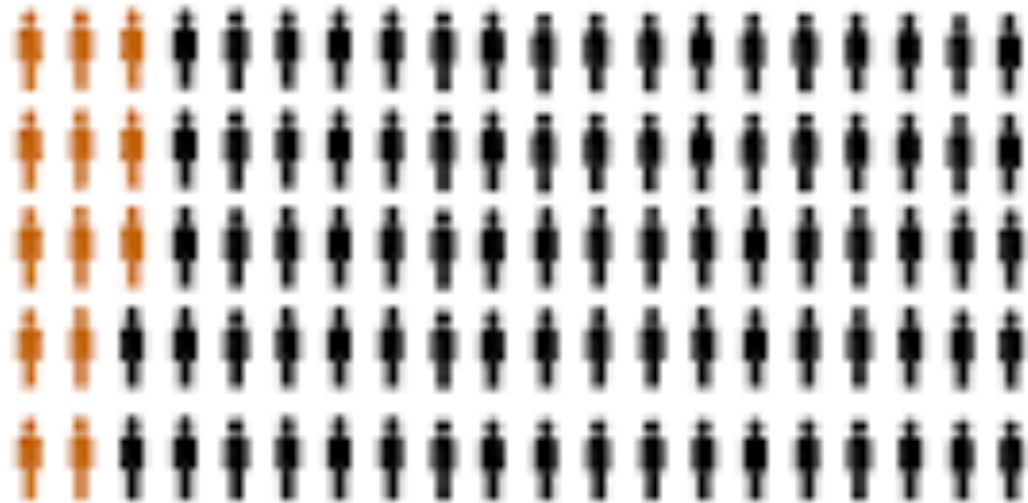
# Introduction

- Disability among the elderly is a global issue, estimated to have affected 460 million people worldwide in 2011.
- Taiwan is one of the affected aging countries.
- Mildly disabled: 1 or 2 disability items  
Moderated disabled: 3 or 4 disability items  
Severely disabled: 5 or 6 disability items

# A National Survey in Taiwan in 2015

**13%**  
AGE OVER 65

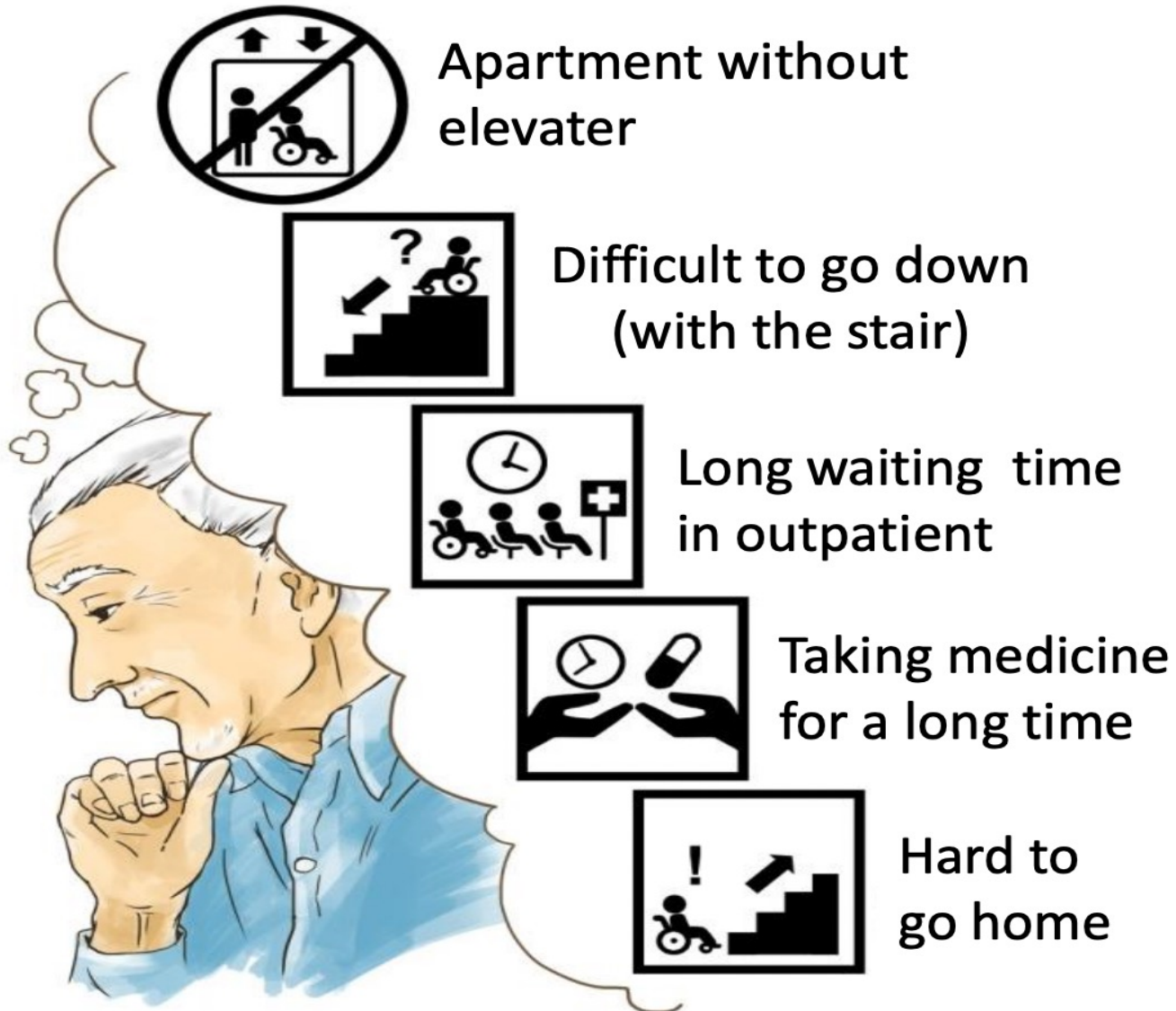
**83.5%**  
Non-DISABILITY



**16.5%** **0.48 million**  
DISABILITY

The number has been estimated to increase to 0.95 million by 2031.

# Challenges Faced by People with Disabilities



**Integrated Home Health Care Program**



# Integrated Home Health Care (IHHC) program

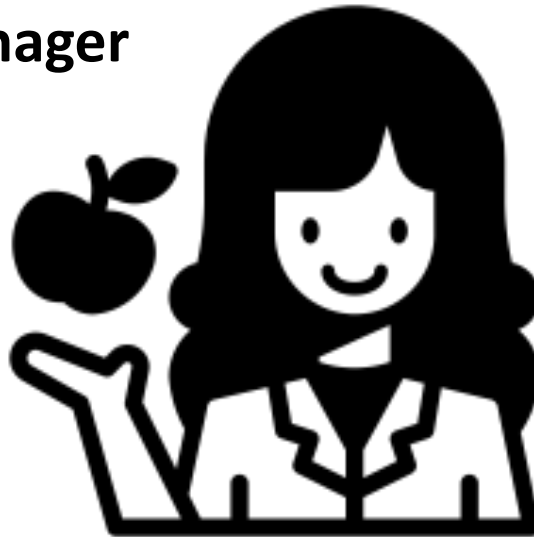
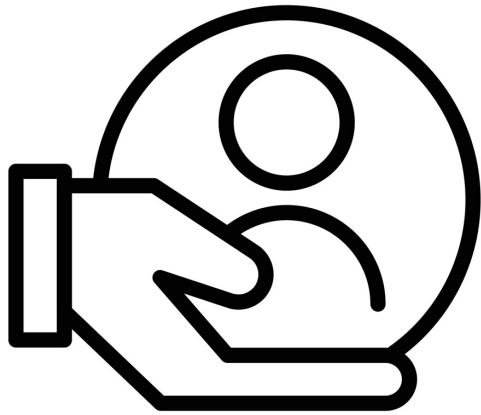
Implemented in Taiwan in 2016, for homebound patients  
**Home Health Coverage**



# Integrated Home Health Care (IHHC) program



Mostly acts as  
case manager



# Qualified for reimbursement to the IHHC

## The disable cases with **clear medical care** demand

- Limited **self-care ability** with **activities of daily living(ADL)** scale score <60 (Barthel Index (BI) < 60 points )
- Needs of specific **medical** care or skilled **nursing** services
  - Changing of catheters or tubes  
urinary catheter, nasogastric tube, tracheostomy, nephrostomy, cystostomy
  - Stage 3 or 4 pressure sore care
- Most of the patients are referred to home health care teams by medical providers due to the need of skilled nursing services.

# Categorized Homebound Patients into **three** stage

Lived at home



Medical needs



Disabled



## Stage 1: Home Healthcare

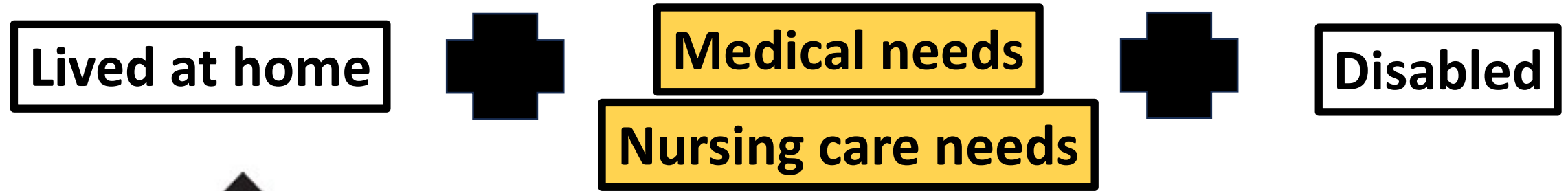
- Limited to residing in one's own home (excluding care facilities).
- Evaluated by the healthcare team's medical personnel to have **clear medical needs**.
- Individuals for whom **seeking medical care outside is inconvenient due to disability or the nature of their illness**.



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# Categorized Homebound Patients into **three** stage



## Stage 2: Intensive Home healthcare

- Must meet the criteria for home healthcare enrollment.
- Patients with limited self-care abilities, with more than 50% of their activities restricted to bed or a chair when awake.
- **In need of continuous nursing care services due to chronic illness or post-discharge requirements.**

# Categorized Homebound Patients into **three** stage

Lived at home



Palliative care



Disabled



## Stage 3: Palliative home healthcare

- Must meet the criteria for home healthcare enrollment.
- Eligible for palliative care under the Palliative Care Act:
  - End-stage cancer
  - Amyotrophic lateral sclerosis (ALS)
  - Organic mental disorders (i.e., dementia)
  - Other cerebral degenerative diseases
  - Congestive heart failure
  - Chronic obstructive pulmonary disease (COPD)
  - Other lung diseases
  - Chronic liver disease and cirrhosis
  - Acute or chronic kidney failure

# Medication Prescription Dispensing Service

- Medications required by the care recipient may be dispensed and delivered by contracted medical institutions with prescriptions, or family members can obtain them from community pharmacies or the original prescribing healthcare institutions using the National Health Insurance card and prescription.
- Adequate pharmaceutical services should be provided when the care recipient lives alone.



# Aim of our study

Would the IHHC program affect **hospitalization and emergency department utilization** among homebound patients?



# Method

- Retrospective cohort study
- Taiwan National Health Insurance Research Dataset
- Analyze homebound patients from 2016 to 2018.
- Compared the differences in the number of
  1. Emergency department visits
  2. Hospitalizations
  3. Length of hospital stay before and after enrollment in the IHHC program.



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# Result

- Homebound patients followed up for at least half year: **18485**
- **S1: 6092, S2: 11758, S3: 635**

# Result

| Homebound patients before/after enrollment                          |               | TOTAL<br>(n=18,485) | S1<br>(n=6,092) |             | S2<br>(n=11,758) |         | S3<br>(n=635) |   | P value |
|---|---------------|---------------------|-----------------|-------------|------------------|---------|---------------|---|---------|
|   |               |                     | n               | %           | n                | %       | n             | % |         |
| Number of outpatient visits in the six months before enrollment     | Mean(SD)      | 15.61±10.85         | 16.07±12.28     | 15.28±10.00 | 17.48±10.90      | <0.0001 |               |   | <0.0001 |
| Number of outpatient visits within six months after enrollment      | Mean(SD)      | 11.90±10.45         | 13.32±11.62     | 11.16±9.71  | 12.01±10.49      | <0.0001 |               |   | <0.0001 |
|   | P value       | <0.0001             | <0.0001         | <0.0001     | <0.0001          |         |               |   |         |
| Number of emergency room visits in the six months before enrollment | Mean(SD)      | 1.15±1.79           | 0.66±1.55       | 1.38±1.81   | 1.60±2.50        | <0.0001 |               |   | <0.0001 |
|   | Median(Range) | 1(0-68)             | 0(0-68)         | 1(0-25)     | 1(0-46)          |         |               |   |         |
|   | Mean(SD)      | 0.86±1.55           | 0.55±1.29       | 1.02±1.64   | 0.96±1.78        | <0.0001 |               |   | <0.0001 |
|   | Median(Range) | 0(0-32)             | 0(0-32)         | 0(0-20)     | 0(0-24)          |         |               |   |         |
|   | P value       | <0.0001             | <0.0001         | <0.0001     | <0.0001          |         |               |   |         |
| Number of hospitalization in the six months before enrollment       | Mean(SD)      | 0.93±1.21           | 0.45±0.85       | 1.14±1.27   | 1.65±1.47        | <0.0001 |               |   | <0.0001 |
|   | Median(Range) | 1(0-12)             | 0(0-7)          | 1(0-12)     | 1(0-8)           |         |               |   |         |
| Number of hospitalization within six months after enrollment        | Mean(SD)      | 0.62±1.06           | 0.36±0.83       | 0.74±1.13   | 0.91±1.25        | <0.0001 |               |   | <0.0001 |
|   | Median(Range) | 0(0-12)             | 0(0-12)         | 0(0-10)     | 1(0-7)           |         |               |   |         |
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| Length of hospital stay in the six months before enrollment         | Mean(SD)      | 12.66±21.18         | 4.27±11.63      | 16.52±23.45 | 21.78±23.46      | <0.0001 |               |   | <0.0001 |
|   | Median(Range) | 2(0-334)            | 0(0-334)        | 8(0-192)    | 15(0-158)        |         |               |   |         |
| Length of hospital stay within six months after enrollment          | Mean(SD)      | 7.36±16.14          | 3.69±11.01      | 9.09±17.85  | 10.54±17.98      | <0.0001 |               |   | <0.0001 |
|   | Median(Range) | 0(0-202)            | 0(0-143)        | 0(0-202)    | 0(0-151)         |         |               |   |         |
|   | P value       | <0.0001             | <0.0001         | <0.0001     | <0.0001          |         |               |   |         |

iHHC program **significantly reduced** total number of **outpatients** visits.

# Subgroup analysis

# Outpatients Visits

| Homebound patients before/after enrollment                      |          | TOTAL<br>(n=18,485) | S1<br>(n=6,092) |   | S2<br>(n=11,758) |   | S3<br>(n=635) |   | P value |
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iHHC program **significantly reduced** number of **outpatients** visits in each group of S1, S2, and S3.

# Result

| Homebound patients before/after enrollment                          |               | TOTAL<br>(n=18,485) | S1<br>(n=6,092) |             | S2<br>(n=11,758) |         | S3<br>(n=635) |   | P value |
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| Number of emergency room visits in the six months before enrollment | Mean(SD)      | 1.15±1.79           | 0.66±1.55       | 1.38±1.81   | 1.60±2.50        | <0.0001 |               |   | <0.0001 |
|   | Median(Range) | 1(0-68)             | 0(0-68)         | 1(0-25)     | 1(0-46)          |         |               |   |         |
|   | Mean(SD)      | 0.86±1.55           | 0.55±1.29       | 1.02±1.64   | 0.96±1.78        | <0.0001 |               |   | <0.0001 |
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| Number of hospitalization in the six months before enrollment       | Mean(SD)      | 0.93±1.21           | 0.45±0.85       | 1.14±1.27   | 1.65±1.47        | <0.0001 |               |   | <0.0001 |
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|   | Median(Range) | 2(0-334)            | 0(0-334)        | 8(0-192)    | 15(0-158)        |         |               |   |         |
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|   | Median(Range) | 0(0-202)            | 0(0-143)        | 0(0-202)    | 0(0-151)         |         |               |   |         |
|   | P value       | <0.0001             | <0.0001         | <0.0001     | <0.0001          |         |               |   |         |

iHHC program **significantly reduced** total number of **ER department** visits.

# Subgroup analysis

# Emergency Room Visits

| Homebound patients before/after enrollment                          |               | TOTAL<br>(n=18,485) | S1<br>(n=6,092) |           | S2<br>(n=11,758) |         | S3<br>(n=635) |   | P value |
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iHHC program **significantly reduced** number of **Emergency Room visits** in each group of S1, S2, and S3.



# Result

| Homebound patients before/after enrollment                          |               | TOTAL<br>(n=18,485) | S1<br>(n=6,092) |             | S2<br>(n=11,758) |         | S3<br>(n=635) |   | P value |
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iHHC program **significantly reduced** total number of **hospitalization**.

# Subgroup analysis

# Hospitalization

| Homebound patients before/after enrollment                    |               | TOTAL<br>(n=18,485) | S1<br>(n=6,092) |           | S2<br>(n=11,758) |   | S3<br>(n=635) |         | P value |
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iHHC program **significantly reduced** number of **hospitalization** in each group of S1, S2, and S3.

# Result

| Homebound patients before/after enrollment                          |               | TOTAL<br>(n=18,485) | S1<br>(n=6,092) |   | S2<br>(n=11,758) |   | S3<br>(n=635) |   | P value |
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iHHC program **significantly reduced** length of hospital stay.

# Subgroup analysis

# Length of hospital stay

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|   | Median(Range) | 2(0-334)            | 0(0-334)        | 8(0-192)    | 15(0-158)        | <0.0001 |               |   |         |
| Length of hospital stay within six months after enrollment  | Mean(SD)      | 7.36±16.14          | 3.69±11.01      | 9.09±17.85  | 10.54±17.98      | <0.0001 |               |   |         |
|   | Median(Range) | 0(0-202)            | 0(0-143)        | 0(0-202)    | 0(0-151)         | <0.0001 |               |   |         |
|   | P value       | <0.0001             | <0.0001         | <0.0001     | <0.0001          | <0.0001 |               |   |         |

iHHC program **significantly reduced** length of hospital stay in each group of S1, S2, and S3.

# Conclusion

- The IHHC program not only provides homebound patients with good medical accessibility but also reduces the burden on the medical system, healthcare expenditures, and the risk of homebound patients being exposed to a higher risk of infection in the hospital.



Holistic health care • Pursuit of excellence  
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# TAIPEI CITY HOSPITAL

臺北市立聯合醫院  
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TAIPEI CITY HOSPITAL, YANG MING BRANCH

使命  
(宗旨)

照顧市民健康、守護弱勢族群

願景

成為亞洲第一的社區型醫院

定位  
(目標)

醫養結合的領航者

核心  
價值

正直誠信、團隊合作、創新卓越  
開放共享、關懷當責、同理謙卑

Thanks for your attention!!