



MULTIMORBIDITY AND HOSPITALISATION: Trend of utilisation and the role of supplementary financial health coverage

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Introduction

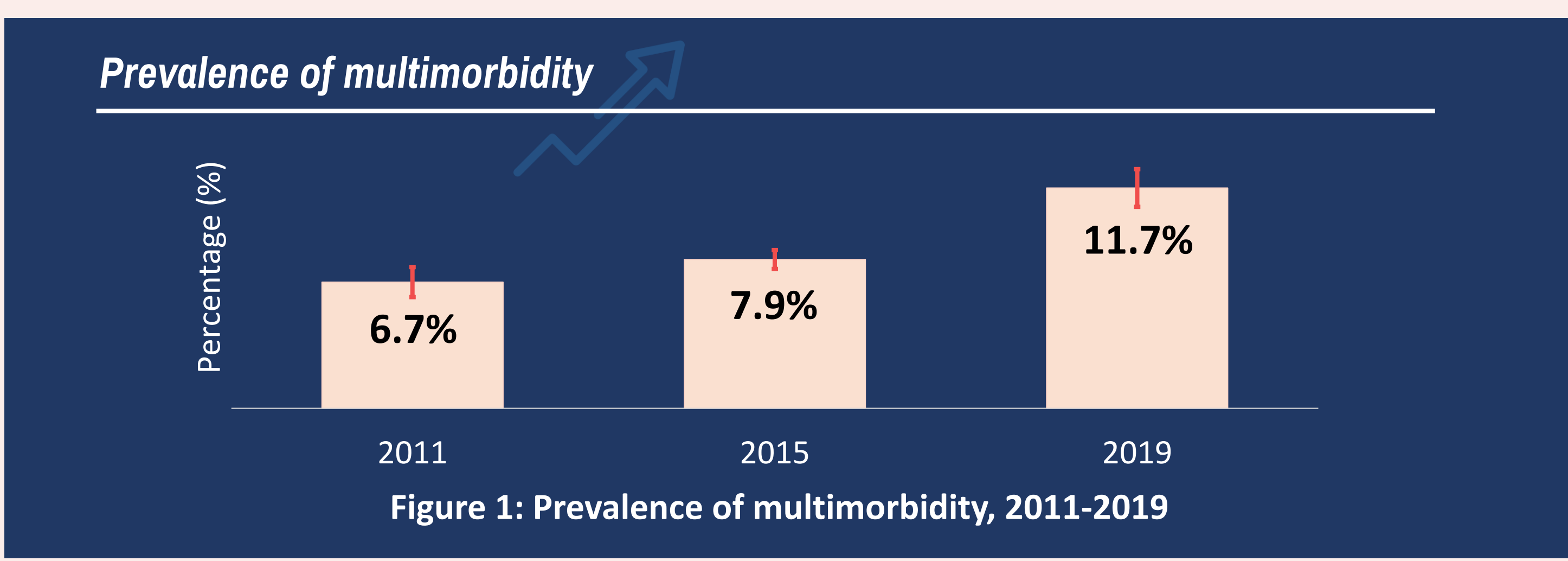
- Multimorbidity, an inevitable rise in NCDs, where **multiple NCDs co-exist** within the same individual.
- Patients with multimorbidity have the **greatest healthcare needs** (1), associated with higher overall hospital-based care and hospitalisation (2), as well as unplanned or preventable hospital admissions (3).
- Malaysia's **dichotomous healthcare system** comprises of public hospitals that offer subsidised services & private hospitals that provide similar care at a higher cost, catering to different affordability and preference levels of individuals.
- Supplementary **financial health coverage** is one of among known **enabling factors** for healthcare utilisation. (4).

Objectives

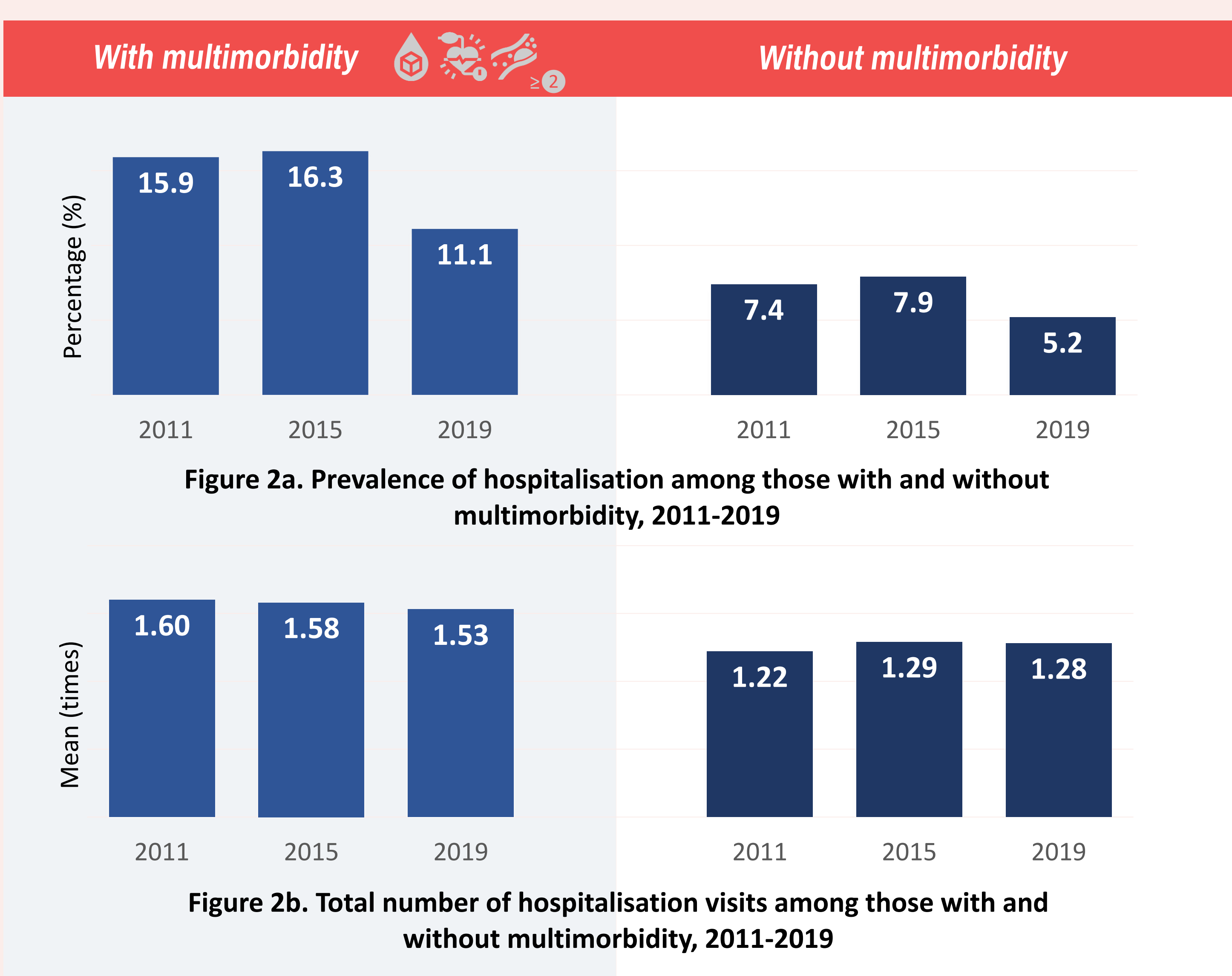
- This study aimed to:
- explore the **trends in the prevalence of multimorbidity and hospitalisation** as well as **mean number of hospitalisation visits**,
 - explore the **trends in the public-private composition for hospitalisation** among those with and without multimorbidity, and
 - assess the **association of multimorbidity and supplementary financial health coverage with hospitalisation**, among Malaysian adults.

Results

- Multimorbidity increased** from 2011 (6.7%, 95%CI 5.9-7.5) to 2015 (7.9%, 95%CI 7.4-8.4), and **almost doubled in 2019** (11.7%, 95%CI 10.7-12.7) (Figure 1).



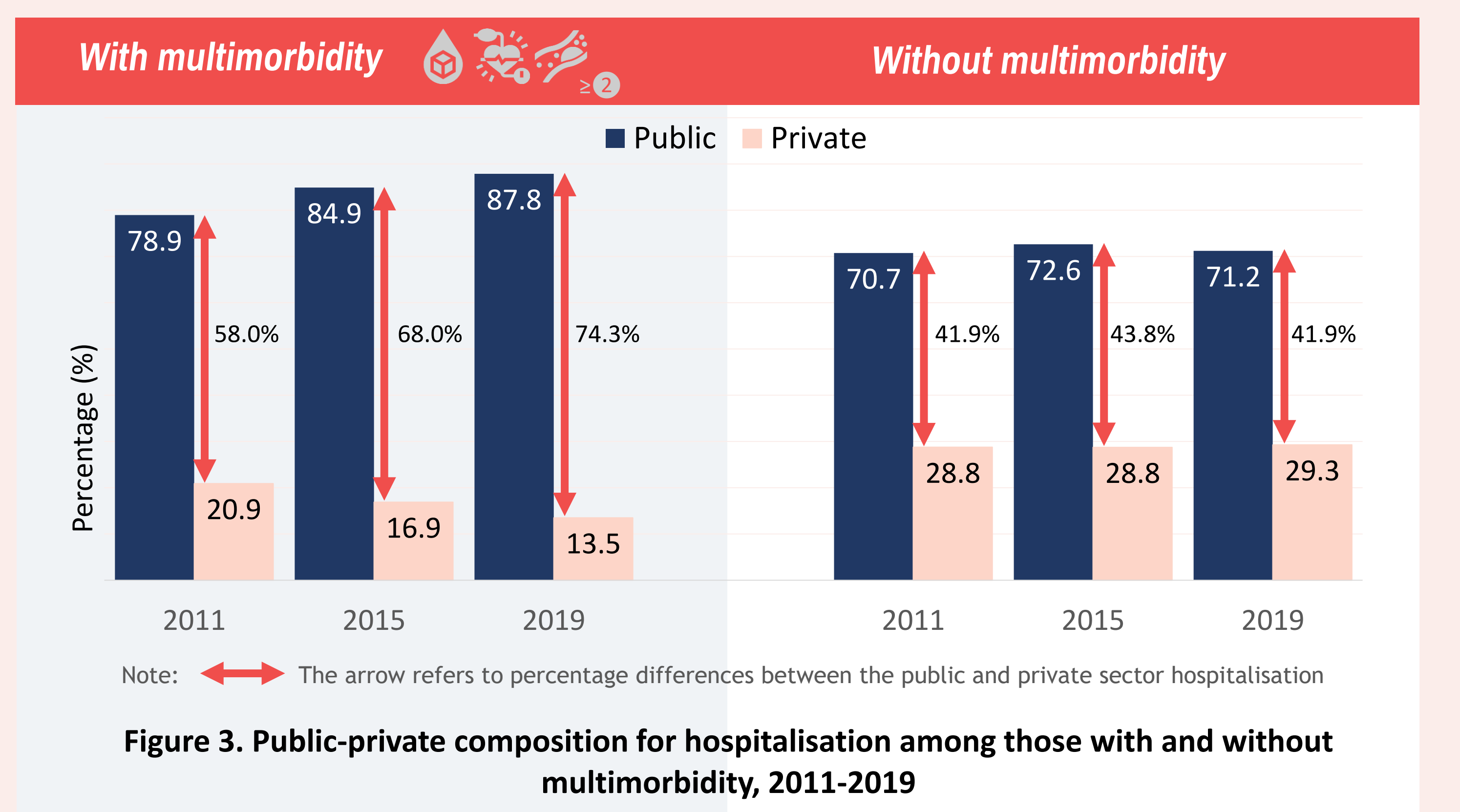
- Individuals with multimorbidity** showed **prevalence of hospitalisation** that was **at least double** than individuals without multimorbidity, across years (Figure 2a).
- In terms of the **total number of hospitalisation visits**, there were slight differences throughout the years for both **multimorbid and non-multimorbid** individuals, in a **decreasing pattern for the former and increasing for the latter** (Figure 2b).



Methods

- Data source**
 Malaysian **adults aged ≥ 18** from three nationwide community-based surveys.
 2011 (n=18,058)
 2015 (n=19,865)
 2019 (n=11,119)
 - Definitions**
 Multimorbidity was defined as **having ≥ 2 chronic conditions** (4):
 Diabetes | Hypertension | Hypercholesterolemia
 - Analyses**
 All analyses conducted using STATA 14 & **sampling weight was applied**.
 Trends over three survey years (2011, 2015 & 2019) were described.
- Hospitalisation:** Overnight stay for treatment in the last 12 months prior to survey
- Supplementary financial health coverage:** Government guarantee letter, government specific health fund, employee health benefit, SOCSO & personal health insurance.
- Descriptive & multivariable logistic regression analysis** were conducted.
Association of independent variables was assessed using **most recent data (2019)**. Variables with $p < 0.05$ in the univariate analysis included in the final model. Significance level was set at 5%.

- There is a **growing hospitalisation gap** between the public and private sectors **over time**, and more **prominent for individuals with multimorbidity** (Figure 3).
- Use of the **public sector hospital services is predominant**, either for multimorbid or non-multimorbid individuals (Figure 3).



- For association with hospitalisation, **multimorbidity (OR = 2.02, 95% CI = 1.50, 2.72)** and **possession of supplementary financial health coverage (OR = 1.81, 95% CI = 1.42, 2.31)** showed significance, after adjustment for sex, ethnicity, age, marital status, perceived self-rated health and working status (Table 1).

Table 1. Logistic regression analysis for factors associated with hospitalisation among Malaysian adults, 2019 (n=11,119)

Variable	COR	95% CI (LL-UL)	p-value	AOR	95% CI (LL-UL)	p-value
Multimorbidity						
Yes	2.28	1.79-2.90	<0.001*	2.02	1.50-2.72	<0.001*
No	1.00	-	-	1.00	-	-
Possession of any supplementary financial health coverage^a						
Yes	1.31	1.05-1.63	0.018*	1.81	1.42-2.31	<0.001*
No	1.00	-	-	1.00	-	-

Note: COR: Crude Odd Ratio, AOR: Adjusted Odd Ratio, CI: Confidence Interval, LL: Lower limit, UL: Upper limit. ^ahealth coverage refers to supplementary financial health coverage. Model adjusted for sex, ethnicity, age, marital status, perceived self-rated health and working status. *p-value < 0.05. No multicollinearity detected (VIF<5). Classification table - 94.1%. Area under curve - 72.1%. Goodness of fit for model: Hosmer-Lemeshow statistic = 0.303.

Discussion / Conclusion

- This study has shown an **increasing trend of multimorbidity** in the Malaysian population, with **corresponding higher utilisation of hospital services**. These results are in line with other published studies that found an association between multimorbidity and increased use of healthcare (2).
- Hospitalisation is known to incur various costs to the patient (1), hence the significant association with supplementary financial health coverage concurs with reported **importance of financial-related factors to generate access to care**.
- Between multimorbidity and possession of supplementary financial health coverage, multimorbidity showed a higher effect measure compared to health coverage. This hints that **load of illness is a substantial consideration when seeking and accessing healthcare services**.
- This study's main strength is the use of a nationally representative sample, which enables robust cross-sectional level estimations for key variables. Nonetheless, further research is needed to better understand the epidemiology of multimorbidity and associated impacts on health care utilisation and costs in Malaysia.
- Our study demonstrates the **growing burden of NCD multimorbidity in Malaysia and implications of multimorbidity on hospitalisation**. Understanding the association of multimorbidity and health coverage with hospitalisation could assist in reviewing existing policy, which aims to facilitate the transition needed for health systems and further anticipated to develop a resilient public healthcare system.

Acknowledgements

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