

# When the dead tell a story.....

## Comparing the COVID-19 Mortality Occurring in Hospitals and those Brought-in-Dead within Malaysia

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### Key message

- **Foreigners were 4 times more likely to die outside the hospital (BID) when compared to Malaysians**

### Introduction

- Deaths amongst COVID-19 patients can occur in 2 instances- either in hospitals after medical interventions OR outside the hospital before medical attention has been given- largely termed as Brought-In-Dead (BID).
- Part of the issues in some countries- the number of BIDs that occur are perhaps due to COVID-19.
- Up to the time of the research analysis, Malaysia has seen 300,752 cases- 273,417 (90.91%) recovered and 1,130 deaths (Case Fatality Rate: 0.38%) with 6.2 million people already tested.
- All deaths brought into Malaysian hospitals for post-mortem requires a COVID-19 test.

### Objective

The aim of this study was to compare the deaths that were Brought-in- Dead (BID) and within the hospitals here in Malaysia including demographic factors that influenced it.

### Methodology

- Type of study** : Cross-sectional study from March 20- Feb 2021
- Study frame** : All the BIDs compared to randomly selected hospital deaths from the same time period (1:1 ratio)
- Sample** : All BID cases that had complete details
- Technique of data collection** : Secondary data obtained from open data sources <http://covid-19.moh.gov.my/> or <https://kpkesihatan.com/>
- Ethics** : Study registered with NMRR, MREC approved

#### • Step-wise methodological flowchart

#### Step 1: Obtaining data

Daily death data obtained from official websites from <https://kpkesihatan.com/> and <http://covid-19.moh.gov.my/terkini>

Data obtained and entered into a standardised data collection sheet collecting demography, place of death, death (hospital/BID) and co-morbids

Data entered into SPSS v 20.0 and cleaned

#### Step 2: Selection of samples

All BID data were included & Deaths in the hospital were randomly selected using a random sampling calculator on a 1:1 ratio to compare with the BIDs

#### Exclusion criteria:

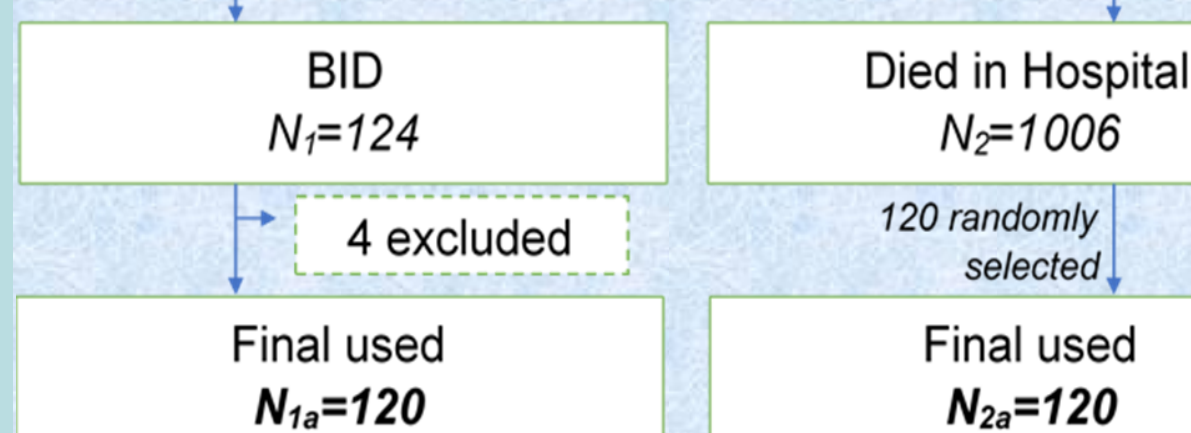
- Incomplete data
- Data of patients dying outside Malaysia
- Cases that were reported as backdated deaths

#### Step 3: Data analysis

Final data analysed

### Results (Descriptive and basic analytics)

Total Deaths: 1130



#### Basic Demography comparison

Variables		BID n (%) N <sub>1a</sub> = 120	Died in hospital n (%) N <sub>1b</sub> = 120	p value
Age	(Mean ±SD)	59.59 (18.74)	64.33 (16.00)	<b>0.03</b>
Gender	Male	85 (70.8)	74 (61.7)	0.13
	Female	35 (29.2)	46 (39.3)	
Nationality	Malaysian	74 (61.7)	107 (89.2)	<b>&lt;0.001</b>
	Foreigner	46 (38.3)	13 (10.8)	
States where deaths occurred	Sabah	56 (46.7)	39 (32.5)	<b>0.04</b>
	Selangor	29 (24.2)	37 (30.8)	
	Kuala Lumpur	12 (10.0)	10 (8.3)	
	Sarawak	5 (4.2)	5 (4.2)	
	Perak	4 (3.3)	3 (2.5)	
	Labuan	3 (2.5)	0	
	Pahang	3 (2.5)	2 (1.7)	
	Johor	2 (1.7)	15 (12.5)	
	Melaka	2 (1.7)	0	
	Negeri Sembilan	2 (1.7)	2 (1.7)	
	Penang	2 (1.7)	3 (2.5)	
	Kedah	0	1 (0.8)	
Kelantan		0	2 (1.7)	0.06
	Putrajaya	0	1 (0.8)	
Co-morbidity	Yes	77 (64.2)	93 (77.5)	0.06
	No	43 (35.8)	27 (22.5)	
	Hypertension	60 (50.0)	67 (55.8)	0.68
	Diabetes Mellitus	35 (29.2)	58 (48.3)	
	Chronic Kidney Disease	15 (12.5)	28 (23.3)	
	Dyslipidaemia	12 (10.0)	16 (13.3)	
	Stroke	11 (9.2)	14 (11.7)	
	Ischemic Heart Disease	9 (7.5)	20 (16.7)	
	Obesity	7 (5.8)	7 (5.8)	
	Asthma	5 (4.2)	5 (4.2)	
	Chronic Lung Disease	4 (3.3)	7 (5.8)	
	Immunocompromised/ Oncology	1 (0.8)	4 (3.3)	
Others	7 (5.8)	11 (9.1)		

### Results (Advance analytics)

Binary logistic regression -outcome BID or Died in Hospital. Hosmer and Lemeshow  $p=0.76$ ; Goodness of fit=67.9%, Nagelkerke  $R^2=20.7\%$ , or 79.3% fit (good model-fit).

#### Univariate and multivariate binary logistic regression comparing BIDs & dying in hospital

Variables		Univariate analysis OR (95% CI)	p value	Multivariate analysis AOR (95% CI)	p value
Age		0.98 (0.97-.99)	<b>0.04</b>	0.99 (0.97-1.01)	0.25
Gender	Male	1.51 (0.88-2.58)	<b>0.13</b>	1.68 (0.93-3.05)	0.09
	Female	Ref		Ref	
Nationality	Malaysian	Ref	<b>&lt;0.001</b>	Ref	<b>&lt;0.001</b>
	Foreigner	5.12 (2.58-10.13)		<b>4.32 (2.02-9.24)</b>	

\*States ( $p=0.55$ ) and co-morbids ( $p=0.77$ ) had no statistical significant difference as well

### Summary of findings

Foreigners **4.3X** likely to be BID compared to Malaysians than dying in hospitals



Factors such as age, co-morbids, states where deaths occurs & gender were confounders

### Conclusion

- **Foreigners were 4 times more likely to be BID** due to COVID-19 compared to Malaysians.
- With a high number of foreigners being BID, **consideration on their access to medical care needs, accessibility, costing and mass testing might need to be considered** to ensure that COVID-19 cases are picked up early for mitigation purposes.