



# NEURO-ONCOLOGY IN INDONESIA: CURRENT STATUS, CHALLENGES, AND FUTURE PERSPECTIVES



Selfy Oswari<sup>1,3</sup>, Ita Muharram Sari<sup>2,4</sup>, Achmad Adam<sup>3</sup>, Andri Rezano<sup>4</sup>, Nur Atik<sup>4</sup>

1 Department of Neurosurgery Indonesian National Brain Center Hospital

2 Department of Neurology Indonesian National Brain Center Hospital

3 Department of Neurosurgery, Faculty of Medicine, Universitas Padjadjaran

4 Department of Biomedical Sciences, Faculty of Medicine, Universitas Padjadjaran

## OBJECTIVE

To present the current status, challenges, and future perspectives of neuro-oncology in Public Hospitals in Indonesia.



## METHOD

Cross-sectional Study. This data was derived from the Ministry of Health, Republic Indonesia through the National Healthcare Transformation Report 2022

From a total of 445 public hospitals in Indonesia, the distribution of **human resources, facilities, and therapies** are still uneven. This map shows the representative distribution of Indonesian public hospitals on each province that are varied from level 2-4 which can possibly perform tumor surgery. Most of level 3 and 4 public hospitals are on the western part of Indonesia.

Province	Level				Total
	1	2	3	4	
Aceh	3	8	1		12
North Sumatera	11	10	1	1	23
South Sumatera	8	6		1	15
West Sumatera	10	5	1	1	17
Bengkulu	6		1		7
Riau	8	3		1	12
Riau Islands	3	2	1		6
Jambi	5	2	1		8
Lampung	7	3		1	11
Bangka Belitung Islands	3	3	1		7
West Kalimantan	3	5	1		9
East Kalimantan	1	5		2	8
Central Kalimantan	7	2	1		10
North Kalimantan	3		1		4
South Kalimantan	4	5	1		10
Banten	2	4	2		8
Jakarta	4	7	6	5	22
West Java	11	23	2	2	38
Central Java	9	24	4	2	39
Yogyakarta	2	4		1	7
East Java	4	20	6	3	33
Bali	1	4	3		8
East Nusa Tenggara	12	2	1		15
West Nusa Tenggara	6	2		1	9
Gorontalo	3	3			6
Central Sulawesi	5	4	1		10
North Sulawesi	11	2		1	14
Southeast Sulawesi	8	4			12
South Sulawesi	5	12	3		20
West Sulawesi	3	1			4
North Maluku	6	1			7
Maluku	7	2			9
West Papua	8	1			9
Papua	12	3	1		16
Grand Total	201	182	40	22	445

From the table beside, the province that has the highest number of public hospitals in level 4 is Jakarta, followed by East Java.

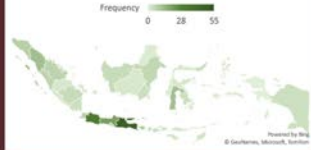
### Problems in Indonesia's neuro-oncology program:

- The ratio of specialists to citizens are far from sufficient.
- Only 237 public hospitals that can perform tumor surgery.
- Only 150 public hospitals that can perform systemic therapy.
- Only 43 public hospitals that can perform radiotherapy.

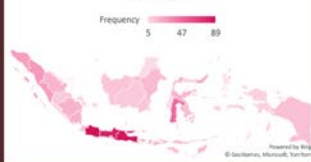
### Possible causes of maldistribution of human resources, facilities, and therapies in Indonesia:

1. Unique geographical archipelago.
2. The policy of regional autonomy.
3. Health literacy.
4. Knowledge and capability of primary care doctors to suspect the symptoms and handle neuro-oncology problems.

Distribution of Neurosurgeons in Public Hospitals in Indonesia



Distribution of Radiologist in Public Hospitals in Indonesia



## CONCLUSION

There is an urgent need to improve and develop existing and non-existing neuro-oncology personnel, logistics, and treatments that public hospitals can provide for all. Along with better management and system of good governance.