

5. Stroke Mortality

Mortality of stroke cases was ascertained by follow-up at 28 days after onset of stroke and verification of death certificate with 'stroke' as cause of death. Matching of death certificates with incident registered cases was done to update vital status and death details were completed. The unmatched death certificates were counted in stroke mortality and date of death was recorded. Currently all 'DCOs' have been considered as ≤ 28 days after onset of stroke.

Case fatality proportion of first-ever stroke is the proportion of people who die from stroke among all individuals diagnosed with the disease within 28 days of onset of stroke. Crude and age adjusted fatality rates and mortality rates of registered first-ever stroke cases for each registry for males and females is reported in this chapter.

Table 5.1. Number n and proportion (%) of deaths among first-ever stroke cases after onset of stroke

Date of onset	Cuttack		Cachar		Tirunelveli		Kota		Varanasi	
	(N=3226)		(N=2493)		(N=3730)		(N=2347)		(N=2024)	
	n	%	n	%	n	%	n	%	n	%
≤ 28 days after onset	540	16.7	1028	41.2	664	17.8	286	12.2	767	37.9
> 28 days after onset	117	3.6	35	1.4	89	2.4	16	0.7	37	1.8

Table 5.2. Crude Case Fatality Rate (CCFR) and Age Standardised Case Fatality Rate (ASCFR) per 100,000 population

Registry	Males		Females		Both sexes	
	CCFR	ASCFR	CCFR	ASCFR	CCFR	ASCFR
	(95% C.I.)	(95% C.I.)	(95% C.I.)	(95% C.I.)	(95% C.I.)	(95% C.I.)
Cuttack	35.0 (31.0-38.8)	22.8 (18.8-26.9)	27.8 (24.2-31.3)	18.8 (15.1-22.8)	31.4 (28.7-34.0)	21.0 (18.1-23.7)
Cachar	53.2 (49.2-57.1)	43.3 (38.3-48.5)	26.2 (23.4-29.1)	22.0 (18.2-25.7)	39.9 (37.4-42.3)	33.0 (29.8-36.2)
Tirunelveli	36.3 (32.7-39.8)	23.9 (20.2-27.7)	24.3 (21.5-27.3)	14.5 (11.8-17.2)	30.3 (27.9-32.5)	18.9 (16.7-21.2)
Kota	17.0 (14.4-19.6)	14.8 (11.3-18.5)	13.5 (11.1-15.9)	11.1 (8.0-14.2)	15.3 (13.5-17.1)	13.0 (10.6-15.3)
Varanasi	54.3 (49.3-59.1)	41.6 (35.9-47.8)	38.2 (33.9-42.6)	28.8 (23.7-33.9)	46.6 (43.3-49.9)	35.5 (31.6-39.5)

Table 5.3. Crude Mortality Rate (CMR) and Age Standardised Mortality Rate (ASMR) per 100,000 population

Registry	Males		Females		Both sexes	
	CMR	ASMR	CMR	ASMR	CMR	ASMR
	(95% C.I.)	(95% C.I.)	(95% C.I.)	(95% C.I.)	(95% C.I.)	(95% C.I.)
Cuttack	41.8 (37.5-46.1)	27.2 (22.8-31.7)	34.5 (30.5-38.4)	23.6 (19.3-27.8)	38.2 (35.3-41.1)	25.5 (22.4-28.6)
Cachar	54.8 (50.8-58.9)	44.9 (39.7-50.1)	27.3 (24.4-30.1)	22.8 (19.0-26.6)	41.2 (38.7-43.7)	34.2 (30.9-37.5)
Tirunelveli	40.2 (36.4-43.9)	26.6 (22.6-30.5)	28.6 (25.5-31.7)	16.9 (14.0-19.8)	34.2 (31.8-36.7)	21.4 (19.0-23.8)
Kota	18.1 (15.5-20.8)	16.0 (12.2-19.7)	14.1 (11.6-16.5)	11.5 (8.4-14.7)	16.2 (14.4-18.0)	13.7 (11.3-16.2)
Varanasi	56.9 (51.9-61.9)	43.9 (37.8-50.0)	40.0 (35.6-44.5)	30.2 (24.9-35.4)	48.9 (45.5-52.2)	37.3 (33.3-41.4)

Table 5.4 Crude Case Fatality Rate (CCFR) and Age Standardised Case Fatality Rate (ASCFR) per 100,000 population

Registry	Ischemic stroke					
	Males		Females		Both sexes	
	CCFR(95% C.I.)	ASCFR(95% C.I.)	CCFR(95% C.I.)	ASCFR(95% C.I.)	CCFR(95% C.I.)	ASCFR(95% C.I.)
Cuttack	19.8 (16.8-22.7)	13.0 (10.-16.1)	13.9 (11.4-16.4)	9.3 (6.7-12.0)	16.9 (14.9-18.8)	11.3 (9.2-13.3)
Cachar	6.8 (5.4-8.2)	6.2 (4.2-8.2)	4.5 (3.4-5.7)	4.2 (2.5-5.9)	5.7 (4.8-6.6)	5.2 (3.9-6.5)
Tirunelveli	19.6 (17.0-22.3)	13.0 (10.3-15.8)	13.4 (11.3-15.6)	7.9 (5.9-9.9)	16.5 (14.8-18.2)	10.3 (8.6-12.0)
Kota	10.7 (8.7-12.8)	9.7 (6.8-12.7)	8.4 (6.5-10.3)	6.8 (4.4-9.2)	9.6 (8.2-11.0)	8.2 (6.3-10.1)
Varanasi	27.1 (23.6-30.5)	20.8 (16.6-25.0)	19.6 (16.5-22.7)	14.6 (10.9-18.2)	23.5 (21.2-25.9)	17.8 (15.0-20.6)
Registry	Haemorrhagic stroke					
	Males		Females		Both sexes	
	CCFR(95% C.I.)	ASCFR(95% C.I.)	CCFR(95% C.I.)	ASCFR(95% C.I.)	CCFR(95% C.I.)	ASCFR(95% C.I.)
Cuttack	9.7 (7.6-11.8)	6.2 (4.1-8.3)	8.1 (6.1-10.0)	5.6 (3.5-7.8)	8.9 (7.5-10.3)	5.9 (4.5-7.4)
Cachar	12.3 (10.4-14.2)	10.5 (8.0-13.1)	4.6 (3.4-5.8)	4.0 (2.4-5.6)	8.5 (7.4-9.6)	7.4 (5.8-8.9)
Tirunelveli	9.8 (7.9-11.6)	6.3 (4.4-8.2)	5.4 (4.1-6.8)	3.3 (2.0-4.6)	7.6 (6.4-8.7)	4.7 (3.6-5.8)
Kota	6.3 (4.7-7.9)	5.1 (3.1-7.2)	5.1 (3.6-6.6)	4.3 (2.3-6.2)	5.7 (4.6-6.8)	4.8 (3.3-6.2)
Varanasi	20.8 (17.7-23.8)	16.2 (12.4-19.9)	14.0 (11.4-16.6)	10.6 (7.5-13.8)	17.6 (15.5-19.6)	13.5 (11.1-16.0)

Registry	Undetermined stroke					
	Males		Females		Both sexes	
	CCFR(95% C.I.)	ASCFR(95% C.I.)	CCFR(95% C.I.)	ASCFR(95% C.I.)	CCFR(95% C.I.)	ASCFR(95% C.I.)
Cuttack	5.5 (3.9-7.0)	3.6 (2.0-5.2)	5.8 (4.2-7.4)	3.9 (2.2-5.7)	5.6 (4.5-6.8)	3.8 (2.6-5.0)
Cachar	34.1 (30.9-37.2)	26.6 (22.7-30.6)	17.1 (14.8-19.4)	13.8 (10.9-16.7)	25.7 (23.7-27.6)	20.4 (18.0-22.9)
Tirunelveli	6.9 (5.3-8.4)	4.6 (2.9-6.2)	5.5 (4.1-6.9)	3.3 (2.0-4.5)	6.2 (5.1-7.2)	3.9 (2.9-4.9)
Kota	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)
Varanasi	6.4 (4.7-8.1)	4.6 (2.6-6.5)	4.6 (3.1-6.1)	3.6 (1.7-5.4)	5.5 (4.4-6.7)	4.2 (2.9-5.6)

Key Findings

- Case fatality proportion (deaths that occurred in less than or equal to 28 days after onset of stroke) ranged 12.2 % in Kota PBSR to 41.2% in Cachar PBSR
- Varanasi PBSR reported the highest CCFR (46.6 per 100,000 population) due to stroke followed by Cachar PBSR (39.9) and Cuttack PBSR (31.4) among all the registries
- Age standardised CFR per 100,000 population was lowest for Kota PBSR (13.0) and highest in Varanasi PBSR (35.5) among all the registries
- CMR per 100,000 population was lowest in Kota PBSR (16.2) and highest in Varanasi registry (48.9)

Limitations of Mortality data

Appropriate and complete Medical Certification of Cause of Death information on stroke was not readily available in all registries, leading to limitations in mortality data.