

# Hospitalization among adults resident in the Africa Centre Demographic Surveillance area in Rural KwaZulu-Natal: South Africa

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# Outline

- ✓ Introduction
- ✓ Methods
- ✓ Ethical consideration and confidentiality
- ✓ Results
- ✓ Conclusion and limitation
- ✓ Acknowledgement



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# Introduction

- ✓ Morbidity from communicable and increasingly non-communicable diseases in low- and middle-income countries related to population aging, urbanization and related changes in lifestyle are of major concern.
- ✓ Serious morbidity resulting in hospitalization is costly to both the individual, the health care system and to society.
- ✓ Adults constitute more than half the population in SSA and survival of children depends to a large extent on the health of the adults.



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# Introduction cont.

- ✓ There is therefore the need to understand causes of hospitalization among adults for efficient patient management and for public health planning and interventions to reduce morbidity.
- ✓ Thus, the objective of the current study was to describe the causes of and factors associated with hospitalization among adults 15 years and older resident in the Africa Centre.



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# Methods

## Study design

- ✓ Secondary data analysis. Population based cohort study.

## Study population

- ✓ Adults aged 15 years and above
- ✓ Resident in the DSA as at 1<sup>st</sup> January 2011.
- ✓ Followed up till 31<sup>st</sup> December, 2013.

## Study setting

- ✓ Located in Mtubatuba in the uMkhanyakude District of northern KwaZulu-Natal and occupies an area of 438km<sup>2</sup>
- ✓ Predominantly rural and almost exclusively Zulu



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# Methods

## Data sources

- ✓ Africa Centre Demographic Information System (ACDIS)
- ✓ Hospital Information System (HIS)

## Outcome variable

- ✓ Hospitalization. Binary variable “Yes” or “No”
- ✓ Discharge diagnosis



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# Methods

## Analysis

- ✓ Causes of hospitalization were described as numbers and percentages of total hospitalization.
- ✓ Factors associated with hospitalization among adults was assessed using Cox proportional hazards model.
- ✓ Analysis was done at a 95% significance level



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# Ethical consideration and confidentiality

## Ethical consideration

- ✓ Ethical approval was sought from the Biomedical Research Ethics Committee of the University of KwaZulu-Natal's Ethics Committee for all data collected from the AC.
- ✓ Data use agreement was obtained from Africa centre.
- ✓ Ethical approval from the University of Witswatersrand Ethics Committee for Human Research sought.
- ✓ Data used for this study did not contain personal identifiers.

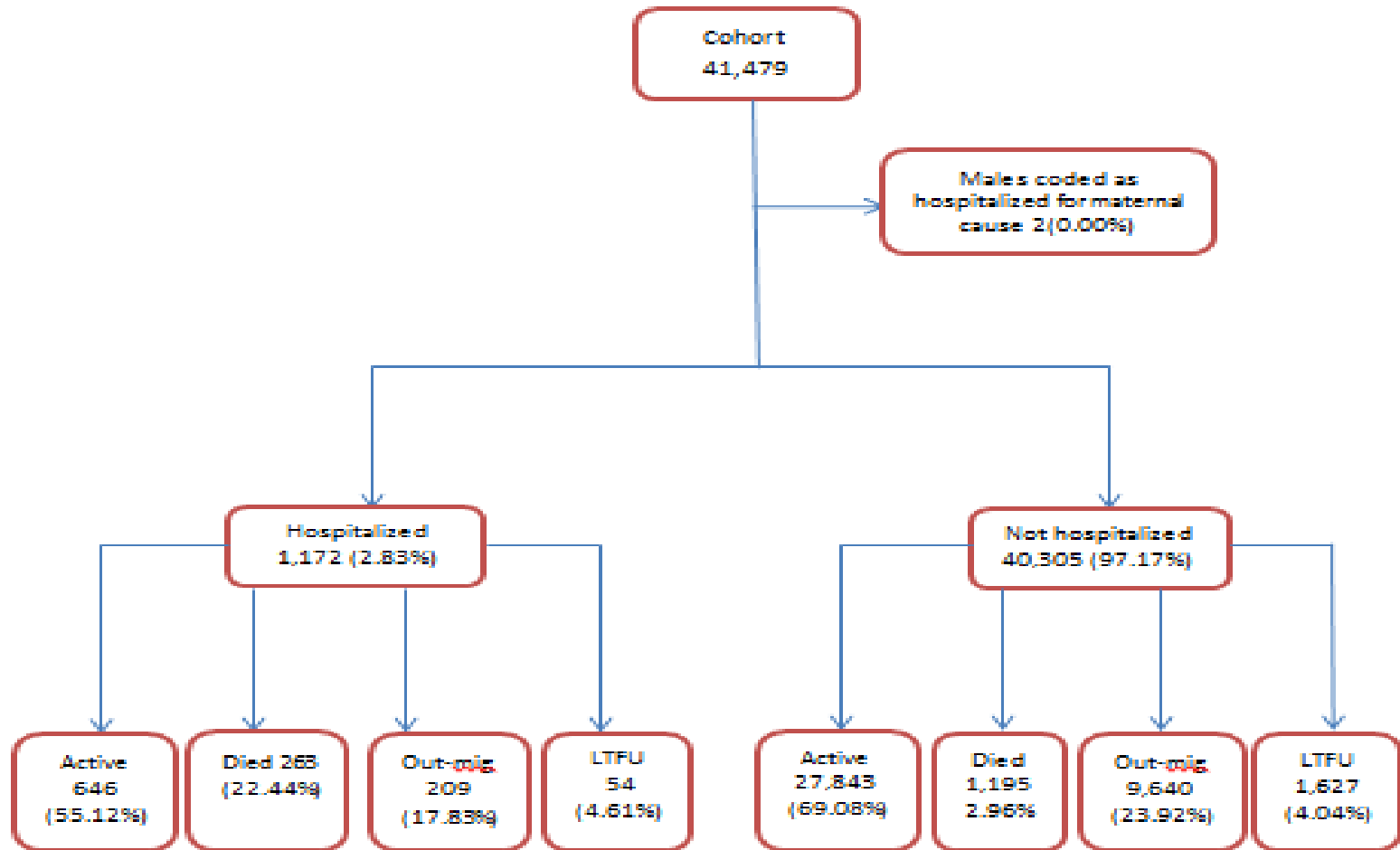


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# Results



A flow chart of the cohort included in the analysis of hospitalization among adults 15 years and older resident in the Africa Centre DSA.

# Results cont.

**Baseline socio-demographic characteristics of cohort included in the analysis of hospitalization among adults 15 years and older resident in the Africa Centre DSA from 2011 to 2013.**

Variable	Category	Not Hospitalized Number (%)	Hospitalized Number (%)	P value
<b>Sex</b>	Male	17,096 (42.42 )	313 (26.71)	<0.01
	Female	23,209 ( 57.58)	859 (73.29)	
<b>Age group</b>	15-19	8,982 (22.29)	172 (14.68)	<0.01
	20-24	6,705 (16.64)	145 (12.37)	
	25-29	5,167 (12.82)	183 (15.61)	
	30-34	3,537 (8.78)	155 (13.23)	
	35-39	2,952 (7.32)	118 (10.07)	
	40-44	2,472 (6.13)	70 (5.97)	
	45-49	2,339 (5.80)	69 (5.89)	
	50-54	2,135 (5.30)	56 (4.78)	
	55-59	1,507 (3.74)	38 (3.24)	
	60 and above	4,509 (11.19)	166 (14.16)	
<b>Education</b>	None	3,679( 9.13)	144(12.29)	<0.01
	Primary	4,186 (10.39)	108 (9.22)	
	Secondary	20,034 (49.71)	538 (45.90)	
	Tertiary	2,478 ( 6.15)	82 (7.00)	
	Unknown	9,928 (24.63)	300 (25.60)	
<b>Employment</b>	Unemployed	18,398 ( 45.65)	612 (52.22)	<0.01
	Employed	7,337 (18.20)	203(17.32)	
	Unknown	14,570(36.15)	357(30.46)	
<b>Grants</b>	None	26,381(65.45)	725( 61.86)	<0.01
	Child support/foster care	1,946(4.83)	32(2.73)	
	Disability grant	1,409(3.50)	68(5.80)	
	Old age pension	2,820(7.00)	117(9.98)	
	Unknown	7,749(19.23)	230(19.62)	
<b>Marital status</b>	Unmarried	22,337 (55.42)	744 (63.48)	<0.01
	Married	5,468 (13.57)	119 (10.15)	
	Separated/divorced	124 ( 0.31)	4 (0.34)	
	Widowed	2,889 (7.17)	97 (8.28)	
	Unknown	9,487 (23.54)	208 (17.75)	
<b>Electricity</b>	No	6,787 (16.84)	196 (16.72)	0.28
	Yes	23,519 (58.35)	708(60.41)	
	Unknown	9,999 (24.81)	268 (22.87)	
<b>Type of residence</b>	Rural	22,931(56.89)	682 (58.19)	0.45
	Peri-urban	13,670 (33.92)	394 ( 33.62)	
	Urban	3,704(9.19)	96 ( 8.19)	



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# Results cont.

- ✓ The cohort consisted of 41,477 participants with 24068(58%) females.
- ✓ 1,172 participants contributed to 1,381 episodes of hospitalization.

## Episodes of hospitalization

- ✓ One episode 1170(84.72%)
- ✓ Two to three 198(14.34%)
- ✓ Four or more 13(0.94%)

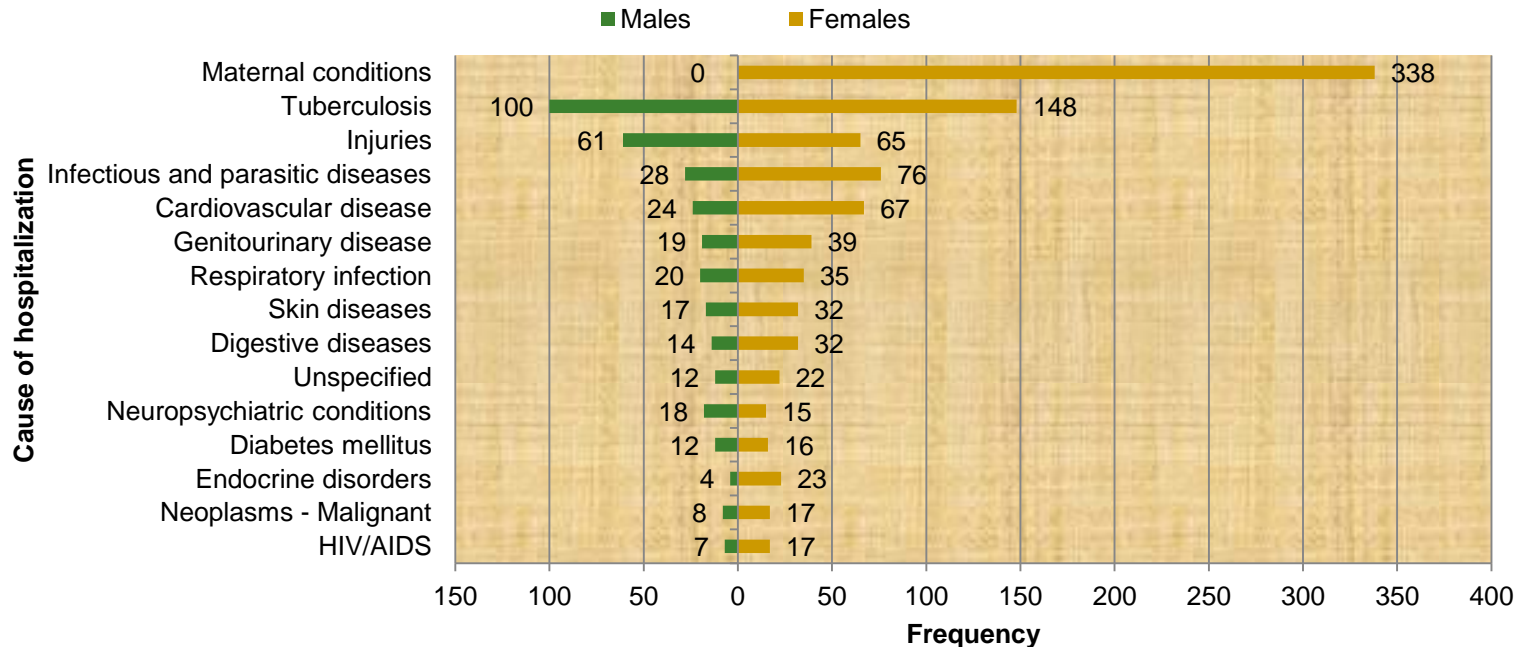


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# Results cont.

## Top 15 immediate causes of hospitalization 2011-2013



- ✓ **Males:** TB 100(27.62%), injuries 61(16.85%), unspecified 29(8.01%), infectious and parasitic infection 28(7.39%) and cardiovascular disease 24(6.63%).
- ✓ **Females:** Maternal conditions 338(34.28%), TB 148(15.01%), infectious and parasitic infections 76(6.80%), injuries 65(6.56%)

# Results cont.

Factors associated with hospitalization among adults 15 years and older resident in the DSA from 2011 to 2013.

Univariable				Multivariable	
Variable	Category	Hazard ratio (95% CI)	P value	Adjusted Hazard ratio (95% CI)	P value
Sex	Male	1			
	Female	1.81(1.57-2.09)	<0.01	7.92(5.07-12.38)	<0.01
Age group	15-19	1			
	20-24	1.29(1.02-1.63)	0.03	1.05(0.55-2.02)	0.88
	25-29	2.04(1.64-2.54)	<0.01	4.12(2.43-7.00)	<0.01
	30-34	2.48(1.97-3.13)	<0.01	8.21(4.93-13.67)	<0.01
	35-39	2.14(1.66-2.75)	<0.01	5.87(3.38-10.19)	<0.01
	40-44	1.51(1.12-2.03)	<0.01	7.87(4.52-13.69)	<0.01
	45-49	1.60(1.16-2.22)	<0.01	7.42(4.16-13.26)	<0.01
	50-54	1.32(0.96-1.82)	0.09	6.48(3.51-11.96)	<0.01
	55-59	1.27(0.89-1.84)	0.22	5.96(3.08-11.56)	<0.01
	60 and older	1.99(1.59-2.50)	<0.01	10.50(6.15-17.92)	<0.01
Sex and age	Female 15-19	1		1	
	Female 20-24	0.95(0.49-1.87)	0.89	0.94(0.48-1.84)	0.86
	Female 25-29	0.31(0.18-0.54)	<0.01	0.31(0.18-0.53)	<0.01
	Female 30-34	0.16(0.09-0.27)	<0.01	0.16(0.09-0.28)	<0.01
	Female 35-39	0.21(0.12-0.38)	<0.01	0.22(0.13-0.40)	<0.01
	Female 40-44	0.09(0.05-0.16)	<0.01	0.09(0.05-0.17)	<0.01
	Female 45-49	0.12(0.07-0.23)	<0.01	0.11(0.06-0.22)	<0.01
	Female 50-54	0.11(0.05-0.21)	<0.01	0.10(0.05-0.20)	<0.01
	Female 55-59	0.11(0.05-2.41)	<0.01	0.10(0.05-0.21)	<0.01
	Female 60 and older	0.08(0.05-0.13)	<0.01	0.07(0.04-0.11)	<0.01



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# Results cont.

Factors associated with hospitalization among adults 15 years and older resident in the DSA from 2011 to 2013.

Univariable				Multivariable	
Variable	Category	Hazard ratio (95% CI)	P value	Adjusted Hazard ratio (95% CI)	P value
<b>Education</b>	None	1		1	
	Primary	0.74(0.59-0.92)	<0.01	0.91(0.72-1.15)	0.43
	Secondary	0.76(0.64-0.91)	<0.01	0.95(0.76-1.18)	0.63
	Tertiary	0.87(0.67-1.12)	0.28	1.08(0.80-1.45)	0.63
	Unknown	0.88(0.73-1.05)	0.16	1.04(0.82-1.31)	0.78
<b>Employment</b>	Unemployed	1		1	
	Employed	0.79(0.69-0.92)	<0.01	0.86(0.73-1.01)	0.07
	Unknown	0.73(0.65-0.82)	<0.01	0.99(0.79-1.23)	0.93
<b>Grants</b>	None	1		1	
	Child support/foster care	0.55(0.39-0.77)	<0.01	0.80(0.55-1.15)	0.22
	Disability	1.59(1.27-2.00)	<0.01	1.68(1.30-2.14)	<0.01
	Old age pension	1.49(1.26-1.78)	<0.01	1.63(1.24-2.16)	<0.01
	Unknown	1.11(0.96-1.27)	0.16	1.22(0.93-1.59)	0.15
<b>Marital status</b>	Unmarried	1		1	
	Married	1.60(0.50-0.71)	<0.01	0.50(0.14-0.61)	<0.01
	Separated/divorced	0.73(0.27-1.94)	0.52	0.66(0.24-1.76)	0.40
	Widowed	0.86(0.71-1.04)	0.14	0.74(0.58-0.95)	0.02
	Unknown	0.59(0.51-0.69)	<0.01	0.78(0.65-0.93)	<0.01
<b>Wealth index</b>	Poorest	1		1	
	Poor	1.30(1.08-1.58)	<0.01	1.40(1.15-1.69)	<0.01
	Average	1.13(0.93-1.37)	0.22	1.18(0.97-1.43)	0.10
	Rich	1.08(0.88-1.31)	0.05	1.17(0.96-1.43)	0.12
	Richest	0.75(0.60-0.93)	0.01	0.86(0.69-1.08)	0.20
	Unknown	1.00(0.84-1.20)	0.99	0.92(0.73-1.16)	0.49

# Results cont.

Factors associated with hospitalization among adults 15 years and older resident in the DSA from 2011 to 2013 excluding maternal causes.

Univariable				Multivariable	
Variable	Category	Hazard ratio (95% CI)	P value	Adjusted Hazard ratio (95% CI)	P value
Sex	Male	1		1	
	Female	1.20(1.03-1.40)	0.02	2.49(1.50-4.11)	<0.01
Age group	15-19	1		1	
	20-24	1.53(1.11-2.11)	0.01	1.09(0.56-2.12)	0.79
	25-29	3.32(2.49-4.42)	<0.01	4.25(2.46-7.32)	<0.01
	30-34	4.94(3.72-6.55)	<0.01	8.43(4.98-14.26)	<0.01
	35-39	4.52(3.37-6.07)	<0.01	6.06(3.44-10.68)	<0.01
	40-44	3.46(2.51-4.77)	<0.01	8.14(4.60-14.39)	<0.01
	45-49	4.03(2.94-5.51)	<0.01	7.66(4.23-13.87)	<0.01
	50-54	3.37(2.42-4.69)	<0.01	6.70(3.58-12.53)	<0.01
	55-59	3.18(2.19-4.61)	<0.01	6.14(3.13-12.06)	<0.01
	60 and older	4.98(3.81-6.51)	<0.01	11.00(6.34-19.09)	<0.01
Sex and age group	Female and 15-19	1		1	
	Female 20-24	1.23(0.59-2.58)	0.58	1.22(0.58-2.55)	0.60
	Female 25-29	0.53(0.29-0.99)	0.05	0.53(0.29-0.98)	0.04
	Female 30-34	0.35(0.19-0.63)	<0.01	0.35(0.19-0.64)	<0.01
	Female 35-39	0.54(0.28-1.01)	0.05	0.56(0.30-1.06)	0.07
	Female 40-44	0.24(0.12-0.46)	<0.01	0.25(0.13-0.48)	<0.01
	Female 45-49	0.39(0.20-0.70)	<0.01	0.37(0.19-0.73)	<0.01
	Female 50-54	0.35(0.17-0.70)	<0.01	0.32(0.16-0.65)	<0.01
	Female 55-59	0.36(0.17-0.80)	0.01	0.30(0.14-0.67)	<0.01
	Female 60 and above	0.25(0.14-0.44)	<0.01	0.20(0.11-0.36)	<0.01



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# Results cont.

Factors associated with hospitalization among adults 15 years and older resident in the DSA from 2011 to 2013 excluding maternal causes.

Univariable				Multivariable	
Variable	Category	Hazard ratio (95% CI)	P value	Adjusted Hazard ratio (95% CI)	P value
<b>Grants</b>	None	1		1	
	Child support/foster care	0.47(0.30-0.73)	<0.01	0.99(0.62-1.58)	0.97
	Disability	2.17(1.71-2.76)	<0.01	1.72(1.32-2.23)	<0.01
	Old age pension	2.08(1.74-2.50)	<0.01	1.59(1.20-2.11)	<0.01
	Unknown	1.18(0.97-1.43)	0.10	1.25(0.92-1.72)	0.16
<b>Marital status</b>	Unmarried	1			
	Married	0.70(0.58-0.85)	<0.01	0.45(0.37-0.57)	<0.01
	Separated/divorced	0.98(0.37-2.62)	0.97	0.67(0.25-1.79)	0.25
	Widowed	1.16(0.95-1.42)	0.21	0.75(0.59-0.96)	0.02
	Unknown	0.49(0.40-0.61)	<0.01	0.81(0.65-1.00)	0.05
<b>Type of residence</b>	Rural	1			
	Peri-urban	1.08(0.95-1.23)	0.25		
	Urban	1.07(0.85-1.33)	0.57		
<b>Wealth index</b>	Poorest	1		1	
	Poor	1.26(1.01-1.58)	0.04	1.38(1.10-1.72)	<0.01
	Average	1.20(0.96-1.51)	0.10	1.30(1.04-1.63)	0.02
	Rich	1.15(0.92-1.44)	0.22	1.31(1.04-1.65)	0.02
	Richest	0.84(0.65-1.08)	0.17	1.01(0.78-1.31)	0.95
	Unknown	1.04(0.81-1.32)	0.77	0.97(0.74-1.26)	0.81



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# Conclusion and limitations

## Conclusion

- ✓ Maternal conditions, tuberculosis, injuries, infectious and parasitic infections as well as cardiovascular diseases were the main causes of hospitalization.
- ✓ There was variation in causes by gender.
- ✓ Participants with disability and the aged on old age pension were at a greater risk of hospitalization which should be considered when health planning strategies and interventions to reduce morbidity are considered.

## Limitations

- ✓ Recall bias
- ✓ Participants attending other hospitals



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# Thank you



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