

## Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

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## **SUPPLEMENTARY APPENDIX**

### **Burden of disease in adults admitted to hospital in a rural region of coastal Kenya: an analysis of data from linked clinical and demographic surveillance systems**

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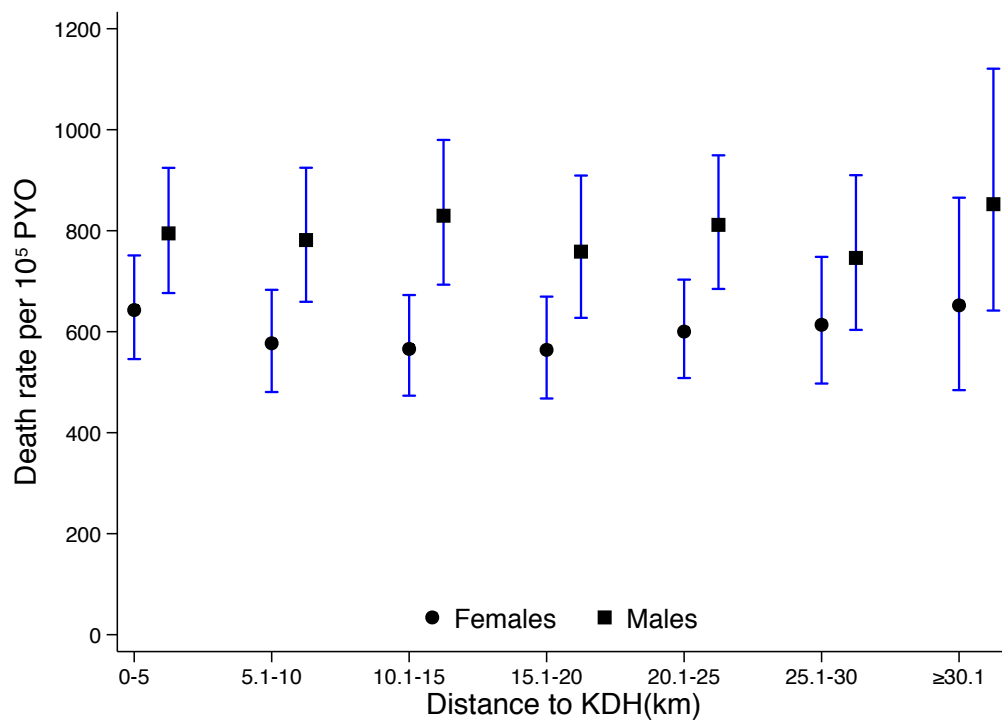
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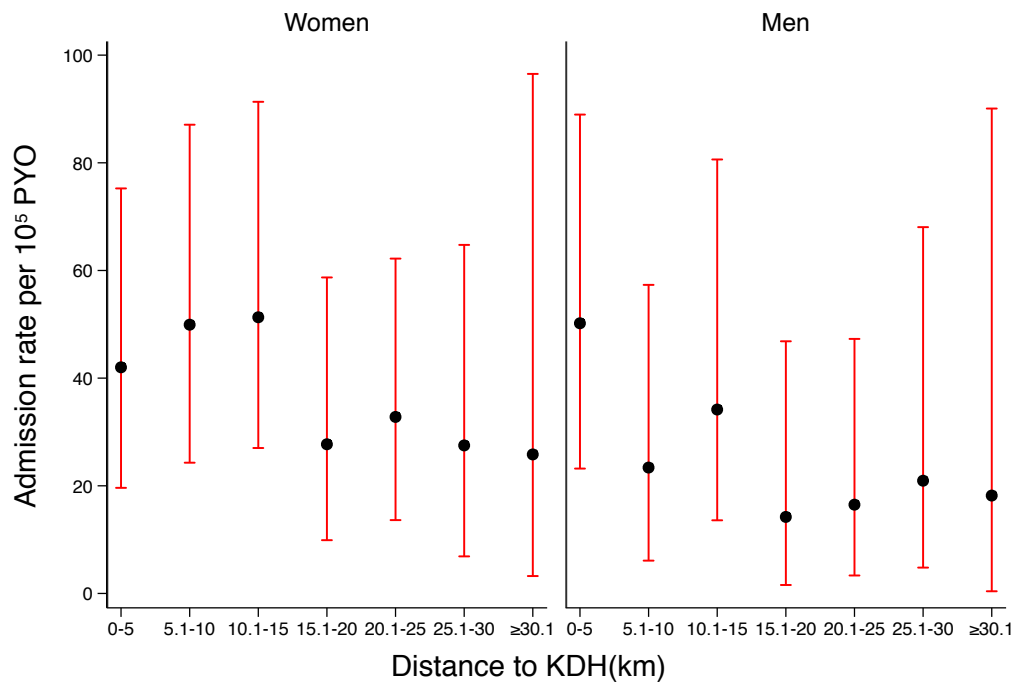
Figure 1: Age standardized KHDSS death rates by distance from Kilifi District Hospital



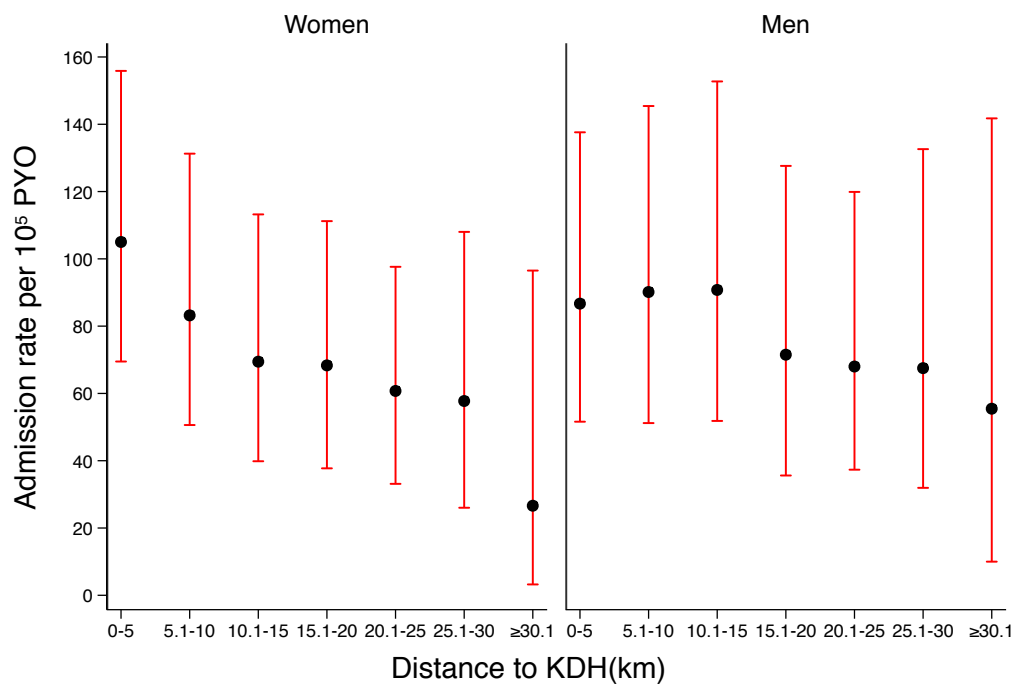
\* Rates are per 100,000 Person Years of Observation (PYO) and are age-standardized

Figure 2: Admission Rates for ICD Categories by Distance to KDH

A. Blood disorders



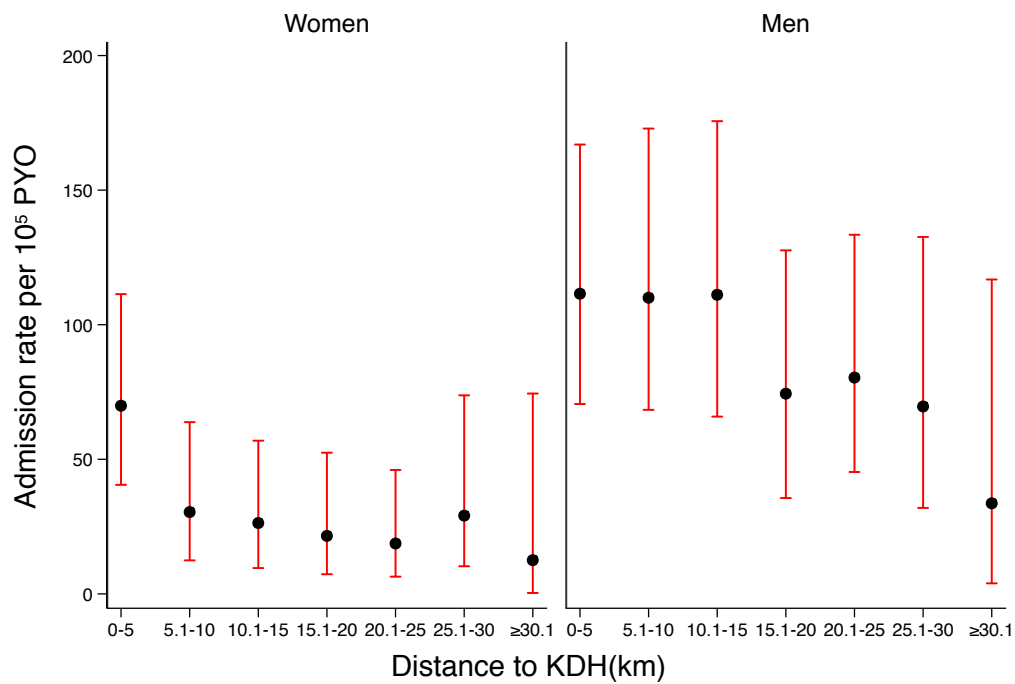
B. Circulatory disorders



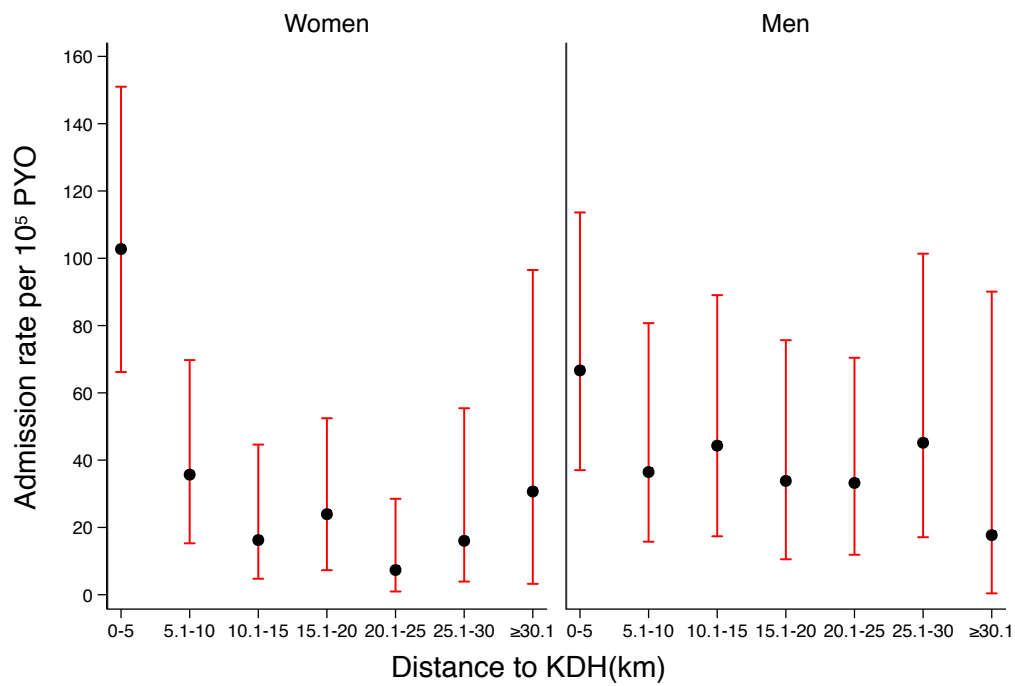
\* Rates are per 100,000 Person Years of Observation (PYO) and are age-standardized

Figure 2: Admission Rates for ICD Categories by Distance to KDH

C. Digestive System



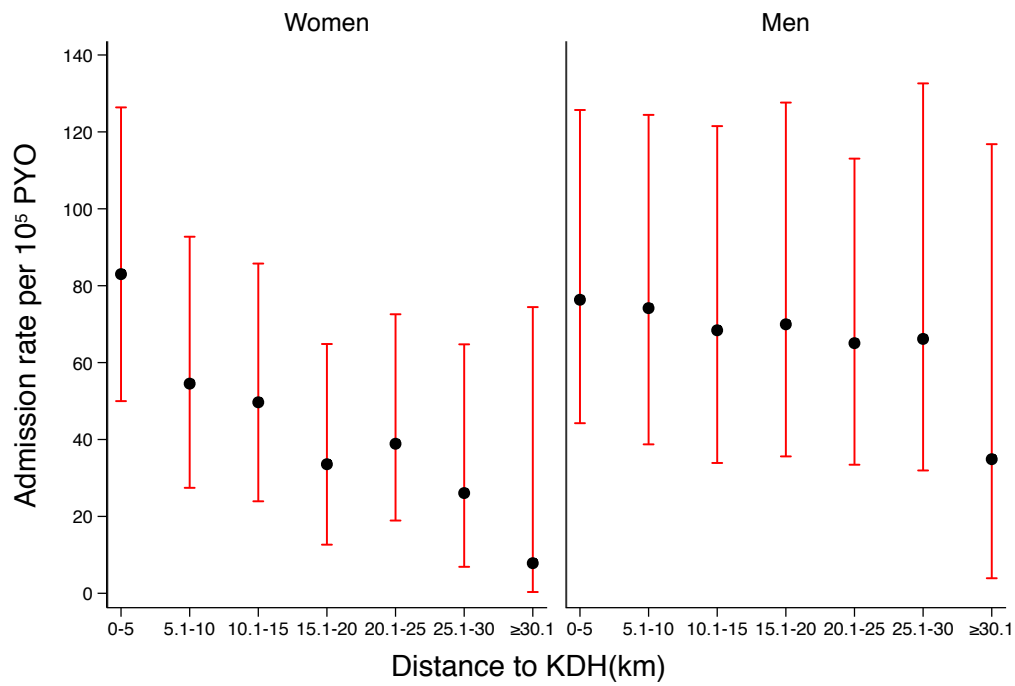
D. Endocrine



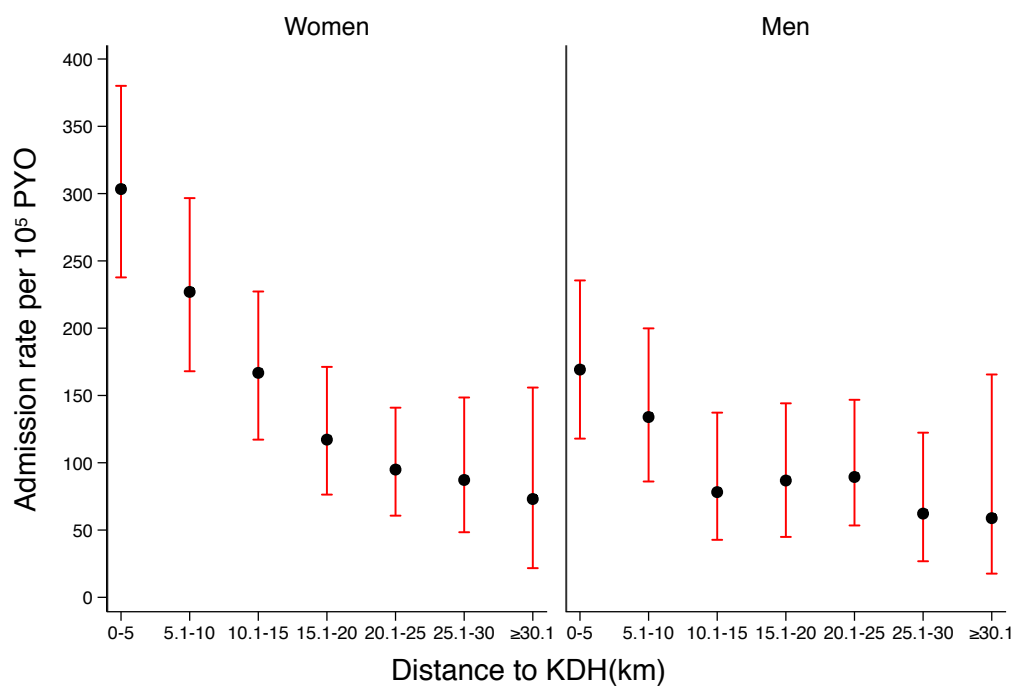
\* Rates are per 100,000 Person Years of Observation (PYO) and are age-standardized

Figure 2: Admission Rates for ICD Categories by Distance to KDH

E. Genitourinary System



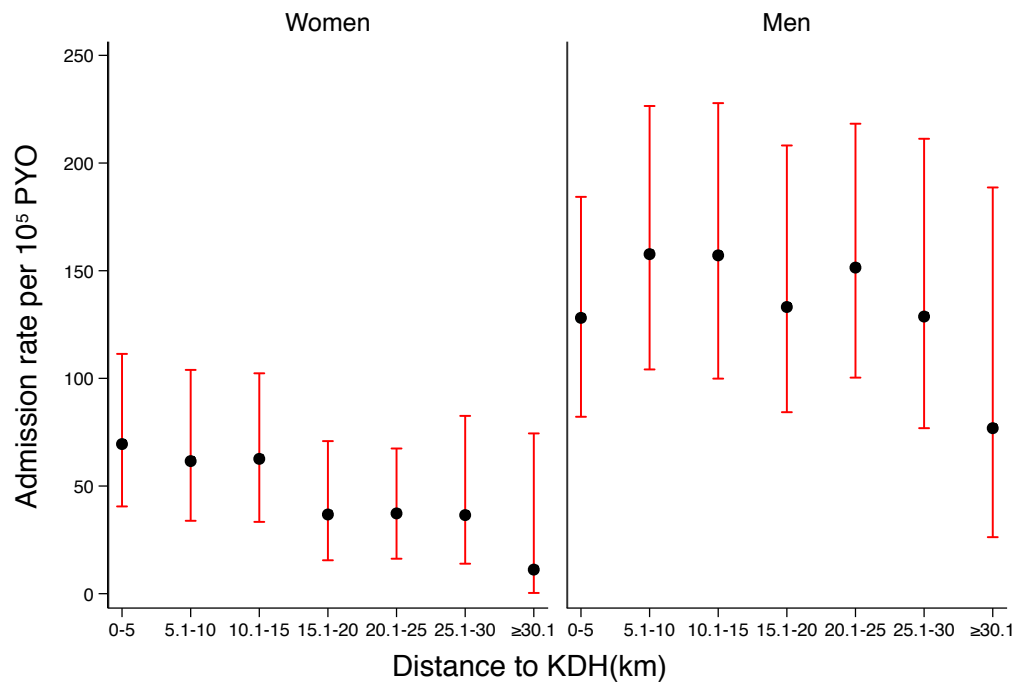
F. Infectious and Parasitic Diseases



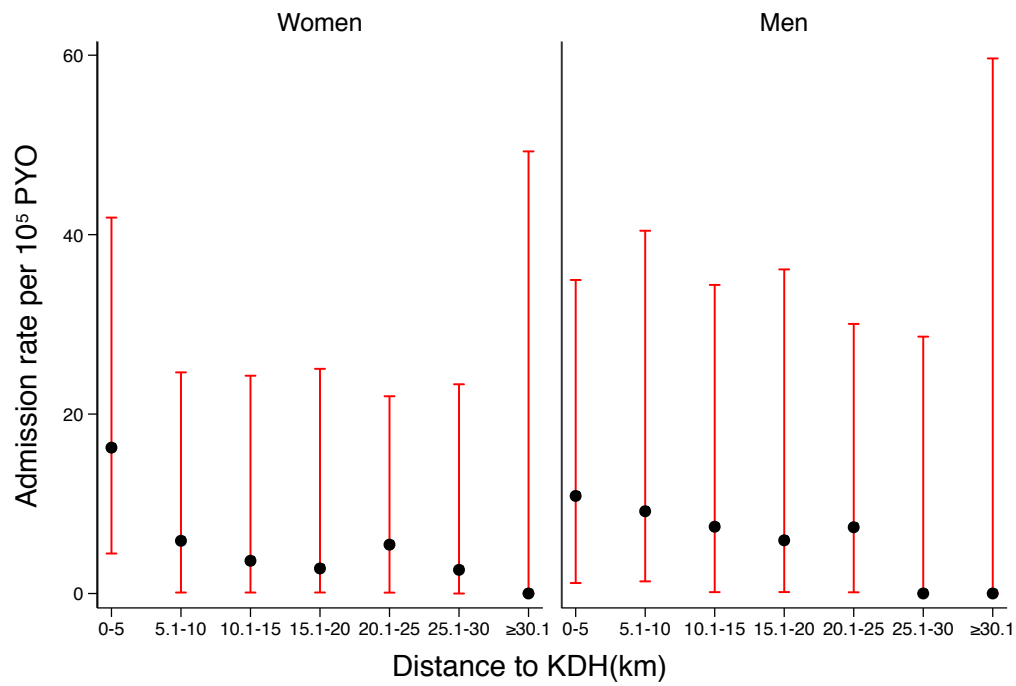
\* Rates are per 100,000 Person Years of Observation (PYO) and are age-standardized

Figure 2: Admission Rates for ICD Categories by Distance to KDH

G. Injuries



H. Musculoskeletal

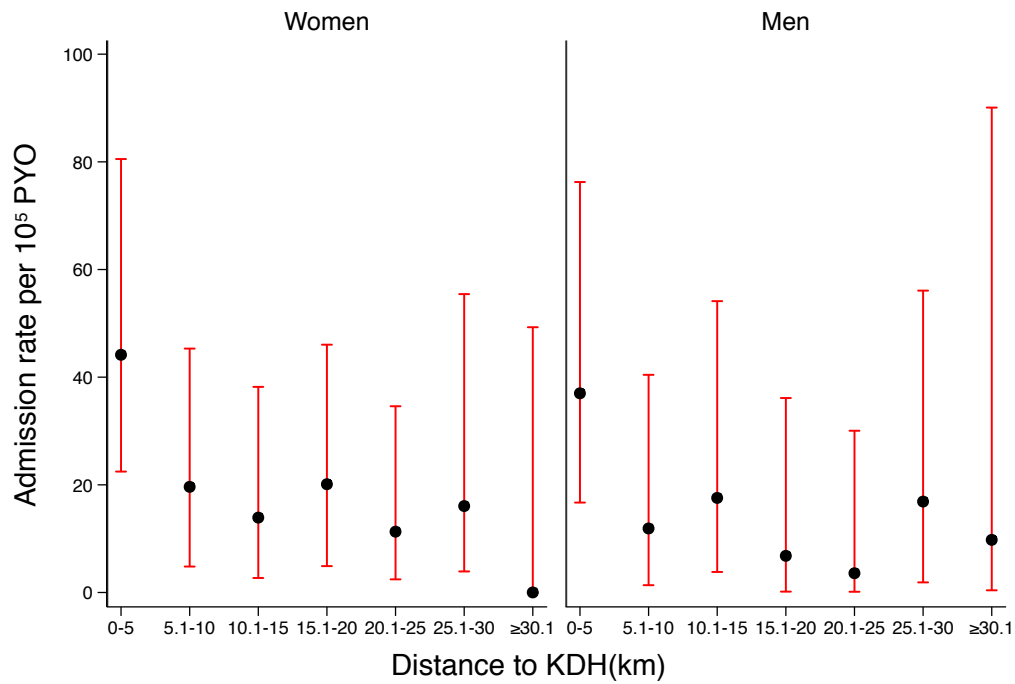


\* Rates are per 100,000 Person Years of Observation (PYO) and are age-standardized

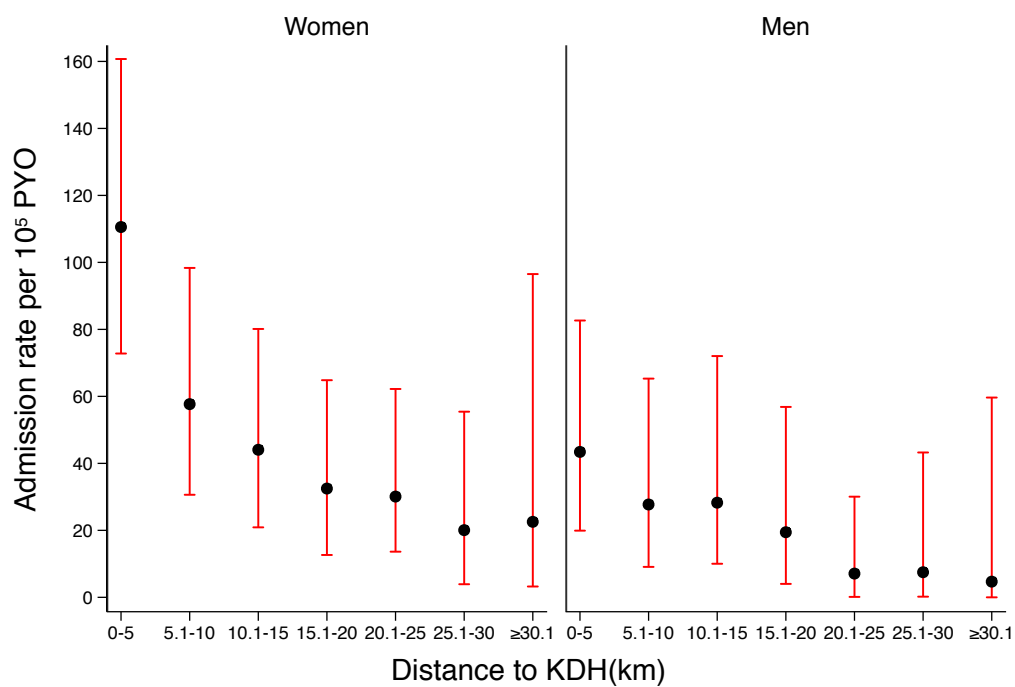


Figure 2: Admission Rates for ICD Categories by Distance to KDH

I. Mental Disorders



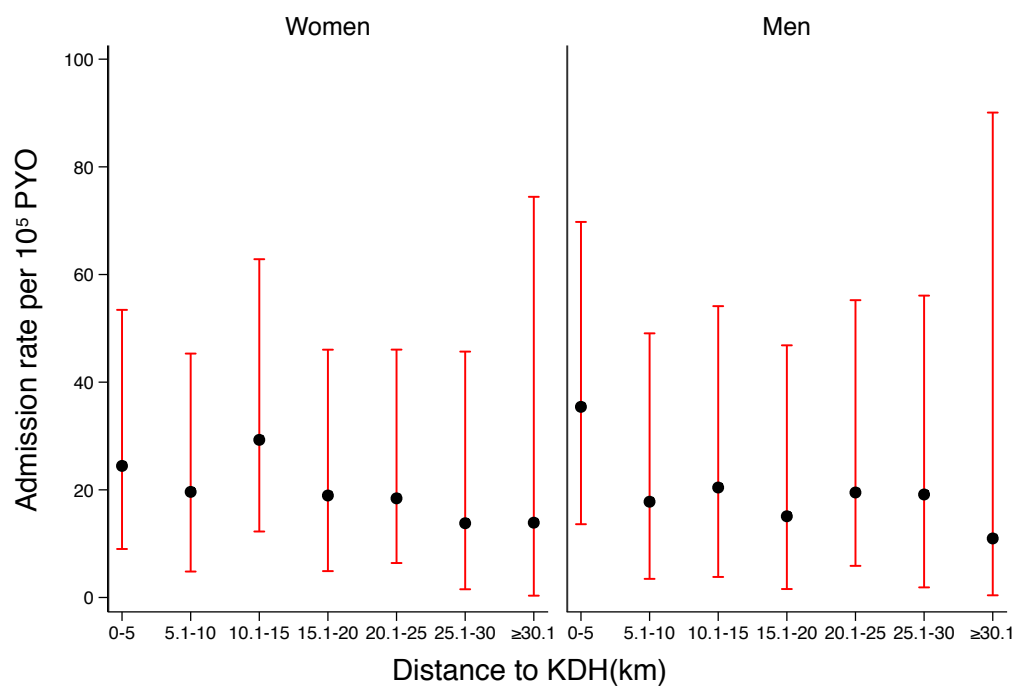
J. Neoplastic Disorders



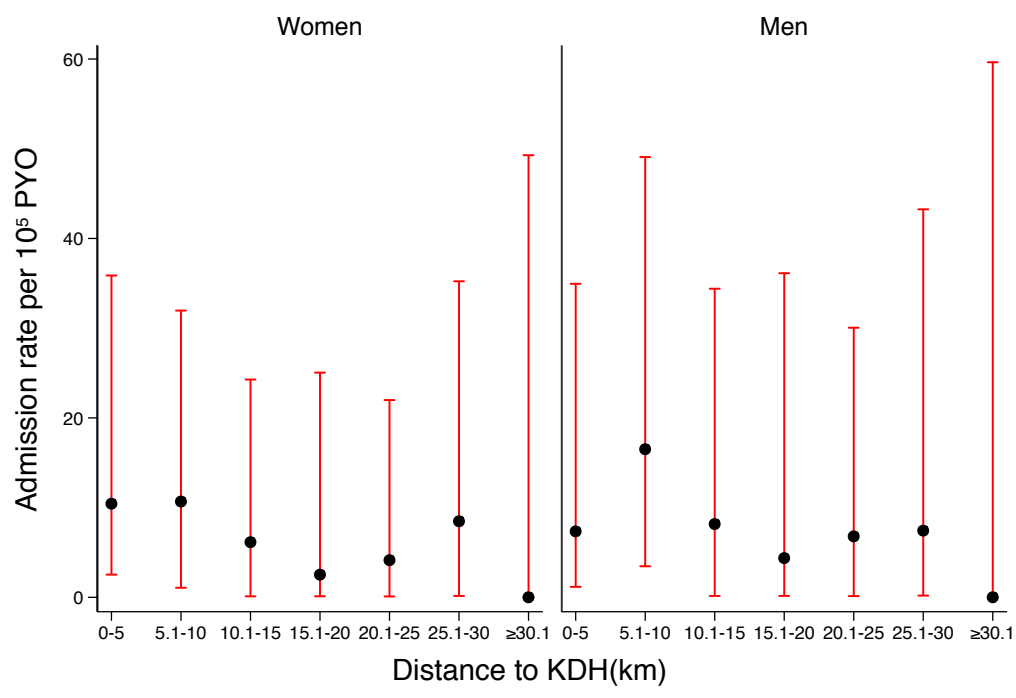
\* Rates are per 100,000 Person Years of Observation (PYO) and are age-standardized

Figure 2: Admission Rates for ICD Categories by Distance to KDH

K. Nervous System Disorders



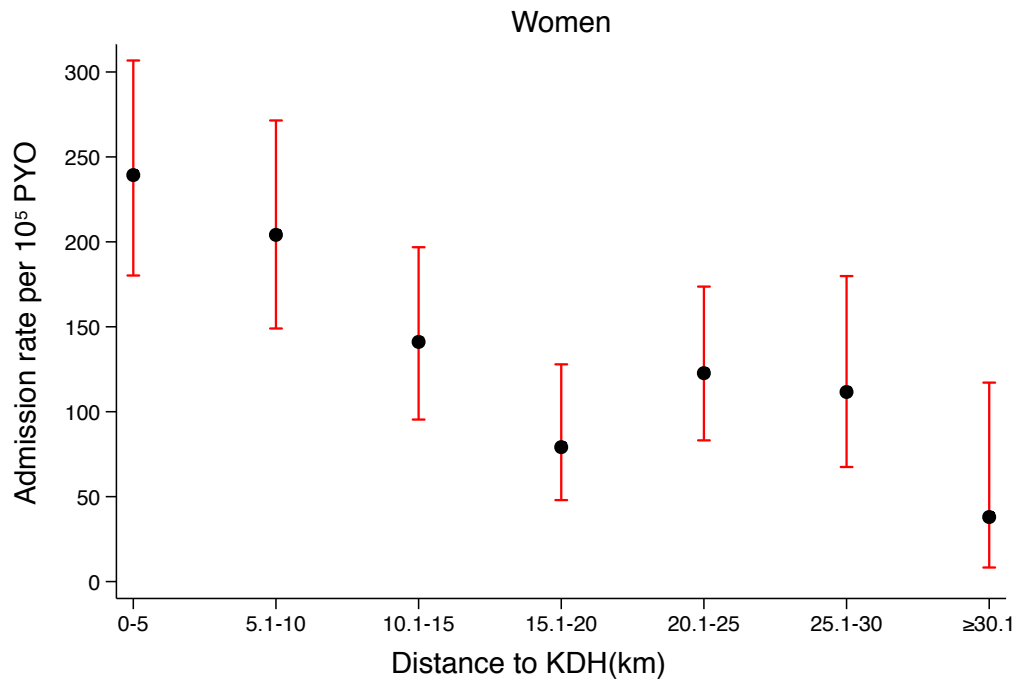
L. Poisoning by External Agents



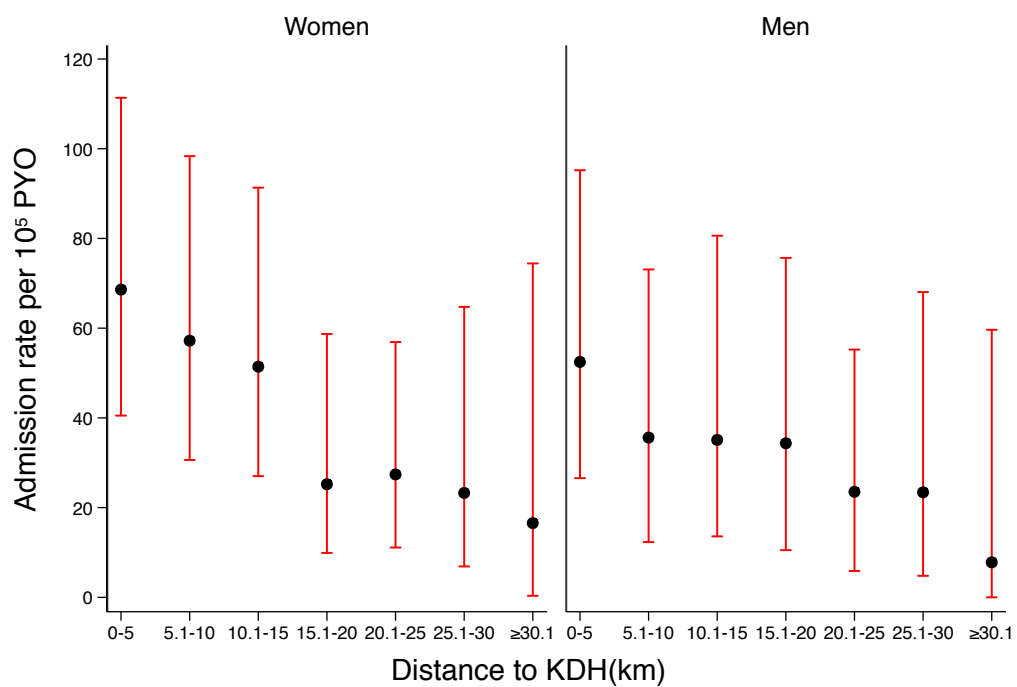
\* Rates are per 100,000 Person Years of Observation (PYO) and are age-standardized

Figure 2: Admission Rates for ICD Categories by Distance to KDH

M. Pregnancy Related Disorders



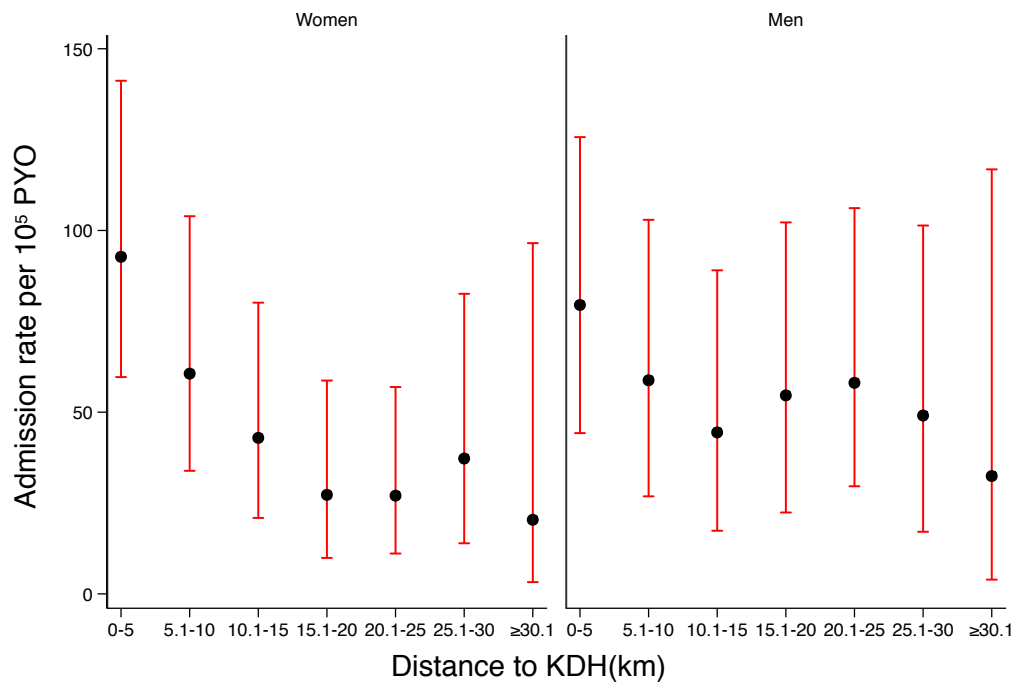
N. Respiratory System Disorders



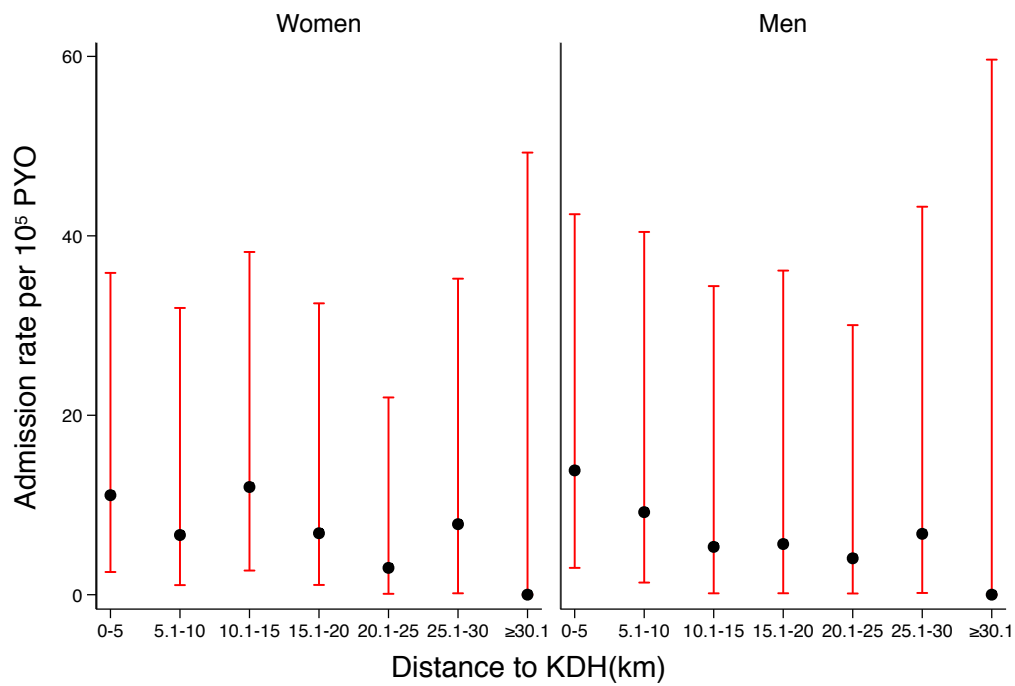
\* Rates are per 100,000 Person Years of Observation (PYO) and are age-standardized

Figure 2: Admission Rates for ICD Categories by Distance to KDH

O. Signs and Symptoms Not Elsewhere Classified



P. Skin Disorders



\* Rates are per 100,000 Person Years of Observation (PYO) and are age-standardized

Supplementary Table: Age Specific Hospitalization Rates for all KHDSS residents

Age Group (years)	Women								Men							
	15-34		35-54		55-74		>75		15-34		35-54		55-74		>75	
ICD Category	Adm rate	95% CI	Adm rate	95% CI	Adm rate	95% CI	Adm rate	95% CI	Adm rate	95% CI	Adm rate	95% CI	Adm rate	95% CI	Adm rate	95% CI
Blood disorders	55	46-65	51	39-65	69	49-95	104	50-190	24	18-32	31	20-46	66	43-98	183	100-306
Circulatory	10	6-14	62	48-77	354	305-408	942	759-1157	7	4-12	71	53-92	362	304-428	1135	909-1399
Digestive	40	33-49	55	42-70	60	41-85	93	43-177	44	35-54	165	138-196	304	251-365	391	264-558
Endocrine	13	9-18	39	29-52	137	107-172	207	126-320	17	11-23	55	40-74	185	144-234	209	0-0
Genitourinary	65	55-76	96	80-116	51	33-73	21	3-75	14	9-20	67	50-87	346	289-411	717	540-934
Infectious and parasitic	176	160-194	333	301-368	284	241-333	425	305-576	85	73-99	232	199-268	211	168-263	326	211-481
Injuries	51	43-61	76	62-94	112	86-145	228	143-345	168	150-187	232	199-268	214	170-266	574	417-770
Mental disorders	40	32-48	26	18-37	15	6-29	0	0-0	32	24-41	23	13-36	8	2-23	0	0-0
Musculoskeletal	3	1-6	17	10-26	15	6-29	31	6-91	9	5-14	5	1-13	11	3-27	117	54-223
Neoplasms	27	21-35	119	100-140	133	104-168	104	50-190	5	2-9	25	15-39	95	67-132	170	90-290
Nervous system	22	16-28	29	20-40	51	33-73	93	43-177	28	21-36	26	16-40	48	28-75	13	0-73
Poisoning	14	10-20	8	4-15	2	0-10	0	0-0	14	9-20	11	5-22	5	1-19	0	0-0
Pregnancy disorders	317	295-340	204	179-231	7	2-19	0	0-0	N/A		N/A		N/A		N/A	
Respiratory system	32	25-40	55	42-70	135	105-170	186	110-295	19	13-26	42	29-58	114	82-153	248	149-387
Skin and subcutaneous	6	3-10	19	12-29	13	5-27	21	3-75	5	2-9	6	2-15	26	13-49	26	3-94
Symptoms & signs not elsewhere classified	29	23-37	63	50-79	138	109-174	476	349-635	25	18-33	86	67-109	206	163-257	430	296-604

Rates are per 100,000 person years of observation (PYO) in the KHDSS

PYOs were as follows: **15-34yrs** F: 258,615 M: 216,124 **35-54** F: 122,152 M: 84,458 **55-74** F: 53,507 M: 38,475 **≥75** F: 9,689 M: 7,615

**Supplementary Table 2: Admission rates by ICD code for individuals living within 5km of Kilifi District Hospital\***

ICD Code	Women		Men	
	Admission Rate	95% Confidence Interval	Admission rate	95% Confidence Interval
A01	0.7	0.0-15.1	0	N/A
A05	2.2	0.1-22.8	0.7	0.0-17.8
A09	57.9	31.3-96.1	44.4	19.9-82.6
A15	1	0.0-15.1	8.7	1.2-34.9
A16	6.9	1.0-29.6	3.7	0.1-27.0
A19	0	N/A	1.5	0.0-17.8
A35	5	0.1-22.8	0.9	0.0-17.8
A41	3.2	0.1-22.8	0.7	0.0-17.8
A49	1.6	0.0-15.1	3.9	0.1-27.0
A82	0.9	0.0-15.1	0	N/A
A86	0.8	0.0-15.1	0.9	0.0-17.8
B01	1.1	0.0-15.1	0	N/A
B02	0.9	0.0-15.1	0	N/A
B17	2	0.0-15.1	0	N/A
B20-24	153.1	106.6-208.7	69.8	37.0-113.6
B37	0.7	0.0-15.1	0	N/A
B50	21.4	6.6-47.7	8.7	1.2-34.9
B54	43.9	22.5-80.5	25.2	7.9-56.4
C00-D48	13.2	2.5-35.9	8.8	1.2-34.9
C15	2.8	0.1-22.8	0	N/A
C16	1.3	0.0-15.1	5.3	0.1-27.0
C18	0	N/A	3.8	0.1-27.0
C22	1.1	0.0-15.1	1.4	0.0-17.8
C40-C41	2.9	0.1-22.8	0	N/A
C41	2.7	0.1-22.8	4.4	0.1-27.0
C43	3.3	0.1-22.8	0	N/A
C43-C44	0	N/A	0.9	0.0-17.8
C50	10.7	2.5-35.9	0	N/A
C53	25.2	9.0-53.4	0	N/A
C55	1.1	0.0-15.1	0	N/A
C56	4.8	0.1-22.8	0	N/A
C61	0	N/A	6.8	0.1-27.0
C67	0	N/A	2.9	0.1-27.0
C71	0.7	0.0-15.1	0	N/A
C91-C94	0	N/A	1.8	0.0-17.8
D17	9	1.0-29.6	7.4	1.2-34.9
D25	30	11.5-59.0	0	N/A
D34	1.3	0.0-15.1	0	N/A
D39	0.7	0.0-15.1	0	N/A
D50	2.6	0.1-22.8	0	N/A
D57	7.7	1.0-29.6	12.2	3.0-42.4
D63	11.9	2.5-35.9	6	0.1-27.0
D64	18.1	4.5-41.9	32.1	13.6-69.8
D72	1.7	0.0-15.1	0	N/A

\* Rates are per 100,000 person-years of observation and are age-standardized

**Supplementary Table 2: Admission rates by ICD code for individuals living within 5km of Kilifi District Hospital\***

E04	3.1	0.1-22.8	0	N/A
E05	0.7	0.0-15.1	0	N/A
E10	0	N/A	1.4	0.0-17.8
E10-E14	97.1	62.9-146.1	62.3	33.5-107.5
E16	1.2	0.0-15.1	1.8	0.0-17.8
E24	0	N/A	1.1	0.0-17.8
E28	0.7	0.0-15.1	0	N/A
E51	0	N/A	0	N/A
E74	0	N/A	0	N/A
E86	0	N/A	0	N/A
E87	0	N/A	0	N/A
F00-F09	1.5	0.0-15.1	2.7	0.1-27.0
F10-F19	0.7	0.0-15.1	2.4	0.0-17.8
F20-F29	3.4	0.1-22.8	12.3	3.0-42.4
F23	15.8	4.5-41.9	10.5	1.2-34.9
F30-F39	12.5	2.5-35.9	6.3	0.1-27.0
F40-F48	7.6	1.0-29.6	2.8	0.1-27.0
F41	0.7	0.0-15.1	0	N/A
F43	2.1	0.1-22.8	0	N/A
G00	0.7	0.0-15.1	3.9	0.1-27.0
G03	12.7	2.5-35.9	19.3	5.3-49.5
G20-G26	0.9	0.0-15.1	0	N/A
G40	4.4	0.1-22.8	4.7	0.1-27.0
G41	0	N/A	1.1	0.0-17.8
G43	2.7	0.1-22.8	0	N/A
G44	2.3	0.1-22.8	1	0.0-17.8
G45	0	N/A	3.5	0.1-27.0
G51	0	N/A	0.9	0.0-17.8
G81	0	N/A	1	0.0-17.8
H60-H62	0.7	0.0-15.1	0	N/A
I05-I09	0.8	0.0-15.1	1.9	0.0-17.8
I10	30.1	11.5-59.0	5.4	0.1-27.0
I11	5.2	0.1-22.8	4.4	0.1-27.0
I15	0.7	0.0-15.1	0	N/A
I20	1.2	0.0-15.1	0	N/A
I21	7.4	1.0-29.6	1.1	0.0-17.8
I24	2	0.0-15.1	0	N/A
I38	0	N/A	1.7	0.0-17.8
I42	6.9	1.0-29.6	6.4	0.1-27.0
I48	0	N/A	2.9	0.1-27.0
I49	2	0.0-15.1	0	N/A
I50	15	4.5-41.9	31.7	13.6-69.8
I64	27.8	11.5-59.0	27.6	10.7-63.2
I67	1.7	0.0-15.1	0	N/A
I71	0	N/A	2.8	0.1-27.0
I80	1.1	0.0-15.1	0	N/A
I84	1.7	0.0-15.1	0.8	0.0-17.8
I89	1.6	0.0-15.1	0	N/A
J01	1.9	0.0-15.1	0	N/A

\* Rates are per 100,000 person-years of observation and are age-standardized

**Supplementary Table 2: Admission rates by ICD code for individuals living within 5km of Kilifi District Hospital\***

J02	0.7	0.0-15.1	0	N/A
J03	3.5	0.1-22.8	2	0.0-17.8
J15	3.1	0.1-22.8	1	0.0-17.8
J18	25.2	9.0-53.4	28.8	10.7-63.2
J20	1.6	0.0-15.1	0	N/A
J22	15.1	4.5-41.9	5.6	0.1-27.0
J40	0.7	0.0-15.1	0	N/A
J45	14.2	2.5-35.9	9.6	1.2-34.9
J46	0	N/A	3.8	0.1-27.0
J90-J91	2.8	0.1-22.8	0.9	0.0-17.8
J93	0	N/A	0.8	0.0-17.8
K04	0	N/A	1	0.0-17.8
K21	1	0.0-15.1	0	N/A
K25	0	N/A	2.7	0.1-27.0
K26	3.8	0.1-22.8	0	N/A
K27	22.8	9.0-53.4	8.1	1.2-34.9
K29	8.6	1.0-29.6	6.4	0.1-27.0
K30	1.7	0.0-15.1	3.7	0.1-27.0
K35	12.2	2.5-35.9	5.8	0.1-27.0
K40	9	1.0-29.6	72.5	40.6-119.7
K56	3.3	0.1-22.8	2.9	0.1-27.0
K60	2.8	0.1-22.8	4.7	0.1-27.0
K61	0.7	0.0-15.1	0.9	0.0-17.8
K72	0.7	0.0-15.1	0	N/A
K73	0	N/A	2.9	0.1-27.0
K80	3.3	0.1-22.8	0	N/A
L02	0.8	0.0-15.1	0.9	0.0-17.8
L03	8.6	1.0-29.6	9.1	1.2-34.9
L27	0.7	0.0-15.1	0	N/A
L50	0	N/A	3.9	0.1-27.0
L91	1	0.0-15.1	0	N/A
M00	2.4	0.1-22.8	2	0.0-17.8
M05-M06	0.7	0.0-15.1	0	N/A
M13	0	N/A	1.9	0.0-17.8
M15	1.8	0.0-15.1	0.7	0.0-17.8
M40	0.8	0.0-15.1	0	N/A
M51	0	N/A	0.7	0.0-17.8
M54	2.7	0.1-22.8	1.5	0.0-17.8
M60	2.7	0.1-22.8	0	N/A
M67	2.4	0.1-22.8	0	N/A
M79	0.9	0.0-15.1	1.1	0.0-17.8
M80-M82	0	N/A	0.7	0.0-17.8
M86	2	0.0-15.1	2	0.0-17.8
N03	0.7	0.0-15.1	0	N/A
N04	3.1	0.1-22.8	1.9	0.0-17.8
N10	0.7	0.0-15.1	2.6	0.1-27.0
N13	0.7	0.0-15.1	0	N/A
N17	4.5	0.1-22.8	0	N/A
N18	1.7	0.0-15.1	5.5	0.1-27.0

\* Rates are per 100,000 person-years of observation and are age-standardized



**Supplementary Table 2: Admission rates by ICD code for individuals living within 5km of Kilifi District Hospital\***

N20	0	N/A	2.1	0.0-17.8
N30	1.7	0.0-15.1	3.8	0.1-27.0
N34	0	N/A	0	N/A
N39	10	1.0-29.6	3.6	0.1-27.0
N40	0	N/A	29.4	10.7-63.2
N43	0	N/A	24.2	7.9-56.4
N45	0	N/A	0.9	0.0-17.8
N62	0	N/A	1.4	0.0-17.8
N63	4.6	0.1-22.8	0	N/A
N70	9.4	1.0-29.6	0	N/A
N73	0.8	0.0-15.1	0	N/A
N75	3.4	0.1-22.8	0	N/A
N80	2.9	0.1-22.8	0	N/A
N81	0.9	0.0-15.1	0	N/A
N82	2.5	0.1-22.8	0	N/A
N83	7	1.0-29.6	0	N/A
N84	1.7	0.0-15.1	0	N/A
N88	6.6	1.0-29.6	0	N/A
N92	11.6	2.5-35.9	0	N/A
N93	6.2	1.0-29.6	0	N/A
N95	1.6	0.0-15.1	0	N/A
N97	0.8	0.0-15.1	0	N/A
NO CODE	12.8	2.5-35.9	5.7	0.1-27.0
O00	5.8	0.1-22.8	0	N/A
O01	1.5	0.0-15.1	0	N/A
O02	4.2	0.1-22.8	0	N/A
O03	157.4	110.0-213.4	0	N/A
O05	11.6	2.5-35.9	0	N/A
O07	10.8	2.5-35.9	0	N/A
O10-O14	2.8	0.1-22.8	0	N/A
O15	2.4	0.1-22.8	0	N/A
O20	14.9	4.5-41.9	0	N/A
O21	7.7	1.0-29.6	0	N/A
O72	4.6	0.1-22.8	0	N/A
O85	9.3	1.0-29.6	0	N/A
O86	2.4	0.1-22.8	0	N/A
O99	3.9	0.1-22.8	0	N/A
P95	14	2.5-35.9	0	N/A
Q85	0.8	0.0-15.1	0	N/A
R01	0.7	0.0-15.1	1.1	0.0-17.8
R03	42.2	19.6-75.2	26.3	7.9-56.4
R04	1.1	0.0-15.1	1.5	0.0-17.8
R06	0	N/A	0.9	0.0-17.8
R09	0.7	0.0-15.1	0	N/A
R10	12.3	2.5-35.9	12.5	3.0-42.4
R15	2	0.0-15.1	2.2	0.0-17.8
R18	0	N/A	2.9	0.1-27.0
R22	10.8	2.5-35.9	5.8	0.1-27.0
R33	0	N/A	5.7	0.1-27.0

\* Rates are per 100,000 person-years of observation and are age-standardized

**Supplementary Table 2: Admission rates by ICD code for individuals living within 5km of Kilifi District Hospital\***

R40	2	0.0-15.1	1.4	0.0-17.8
R50	1.8	0.0-15.1	5.4	0.1-27.0
R55	5.1	0.1-22.8	0	N/A
R58	0.7	0.0-15.1	4.1	0.1-27.0
R59	0.7	0.0-15.1	0	N/A
R73	12.8	2.5-35.9	9	1.2-34.9
R90	0	N/A	0.7	0.0-17.8
S00-S09	8	1.0-29.6	7.4	1.2-34.9
S00-T98	12.6	1.0-29.6	23.3	7.9-56.4
S20-S29	2.9	0.1-22.8	2	0.0-17.8
S30-S40	0.8	0.0-15.1	1	0.0-17.8
T00-T07	5.1	0.1-22.8	13.7	3.0-42.4
T08-T14	3.5	0.1-22.8	19.7	5.3-49.5
T09	0.8	0.0-15.1	5.7	0.1-27.0
T15-T19	2.6	0.1-22.8	0.9	0.0-17.8
T20-T32	0.7	0.0-15.1	2.9	0.1-27.0
T36-T50	10.4	2.5-35.9	7.3	1.2-34.9
T63	17.1	4.5-41.9	22.1	7.9-56.4
T75	0.7	0.0-15.1	0.8	0.0-17.8
T78	4.2	0.1-22.8	0	N/A
T81	7.1	1.0-29.6	19.7	5.3-49.5
T83	0.7	0.0-15.1	0	N/A
V01-V99	2.7	0.1-22.8	9	1.2-34.9
X20-X29	1	0.0-15.1	1.1	0.0-17.8
X20-Y29	3.7	0.1-22.8	0	N/A
X24	0.7	0.0-15.1	0	N/A
X85-Y09	3.8	0.1-22.8	4.4	0.1-27.0
Z32	4.6	0.1-22.8	0	N/A

\* Rates are per 100,000 person-years of observation and are age-standardized

**Supplementary Table 3: Disability Adjusted Life Years (DALY) in the KHDSS for the 15 leading causes of admission to KDH**

<b>Disease</b>	Men		Women		DALY/1 0 <sup>5</sup> PYO
	YLL	YLD	YLL	YLD	
HIV	958	35	1217	60	1154
Stroke	326	28	284	27	330
Meningitis	227	22	175	18	217
Pneumonia	145	6	173	7	167
Diabetes	129	13	104	36	141
Heart failure	150	15	91	10	129
Gastroenteritis	77	0	121	1	103
Cervical Cancer	0	0	60	22	82
Benign prostatic hypertrophy	32	0	0	0	32
Asthma	0	21	0	32	27
Fractures	37	0	7	0	20
Head Injury	25	10	0	3	17
Inguinal Hernia	23	1	7	0	15
Spontaneous abortion	0	0	13	0	7
Peptic Ulcer Disease	0	0	7	1	5

**Footnotes**

1. Years of life lost (YLL), years lived with disability (YLD) and DALY are per 100,000 person years of observation (PYO)
2. Data are for the entire KHDSS