

# THE BURDEN OF HUMAN CORONAVIRUS INFECTION IN CHILDREN HOSPITALISED WITH SEVERE LOWER RESPIRATORY TRACT INFECTION IN CAPE TOWN, SOUTH AFRICA



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## BACKGROUND

- Globally, respiratory tract infections are a major cause of under-five mortality
- Human coronaviruses (HCoVs) are responsible for 5% of all upper and lower respiratory tract infections in children <5 years worldwide
- 229E, NL63, HKU and OC43 are the major HCoV strains and can cause mild respiratory illness in humans
- In order to better understand the epidemiology and burden of human coronaviruses in South Africa, their role in the aetiology of childhood pneumonia needs to be described.

## STUDY AIM & OBJECTIVES

**Aim:** This study aimed to describe the burden of HCoVs infection in children hospitalised with lower respiratory tract infection at the Red Cross War Memorial Children's Hospital (RCWMCH) over a period one year.

- Objectives:**
- To determine the proportion of infants and children admitted to RCWMCH
  - To determine the prevalence of different HCoVs in children hospitalised with aLRTI
  - To assess risk factors associated with HCoV infection.

## METHODS

**Study Design:** This study is a sub-study of the parent study (HREC reference number 371/2011), and utilises data that was prospectively collected over a one-year period from September 7, 2012 to September 6, 2013.

**Study Population:** Infants and children below the age of 13 years who were hospitalised during the study period

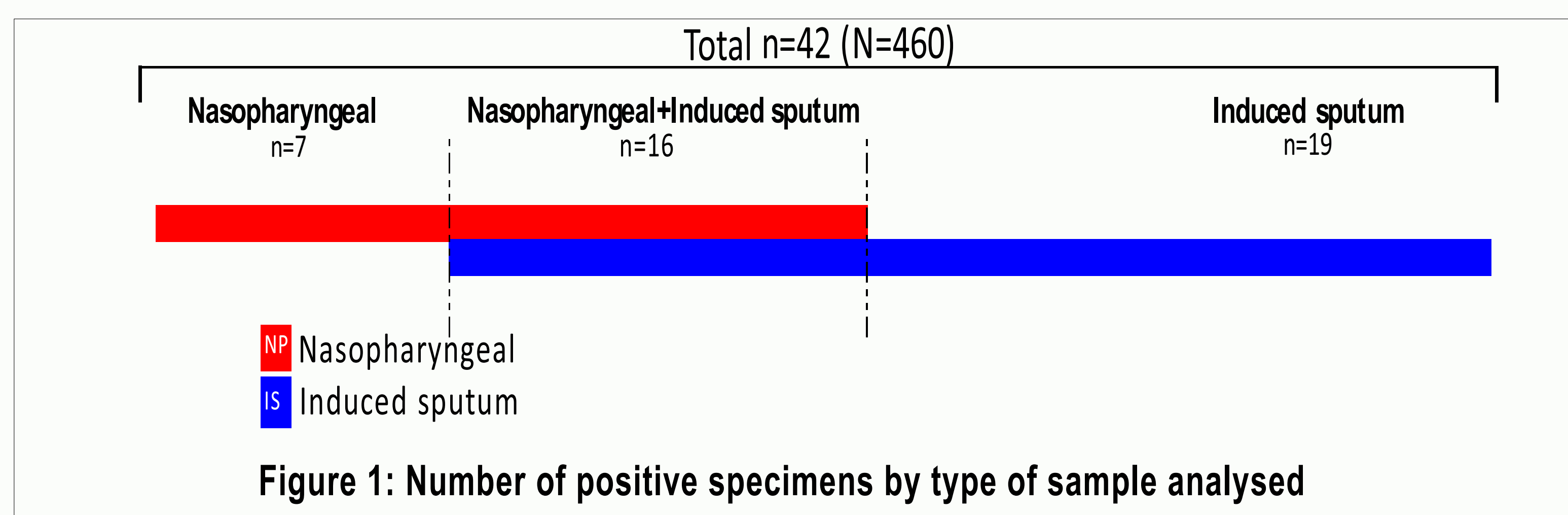
**Outcome of Interest:** the identification of one of the HCoV's by polymerase chain reaction (PCR) on a nasopharyngeal (NP) specimen or from a sample of induced sputum (IS)

**Data Analysis:** The  $\chi^2$  test or Fisher's exact test were used to assess the strength of association between two categorical variables as appropriate. A significance level was set at a two-tailed  $P < 0.05$  for all analysis. Stata version 16 was used to conduct all the statistical analyses

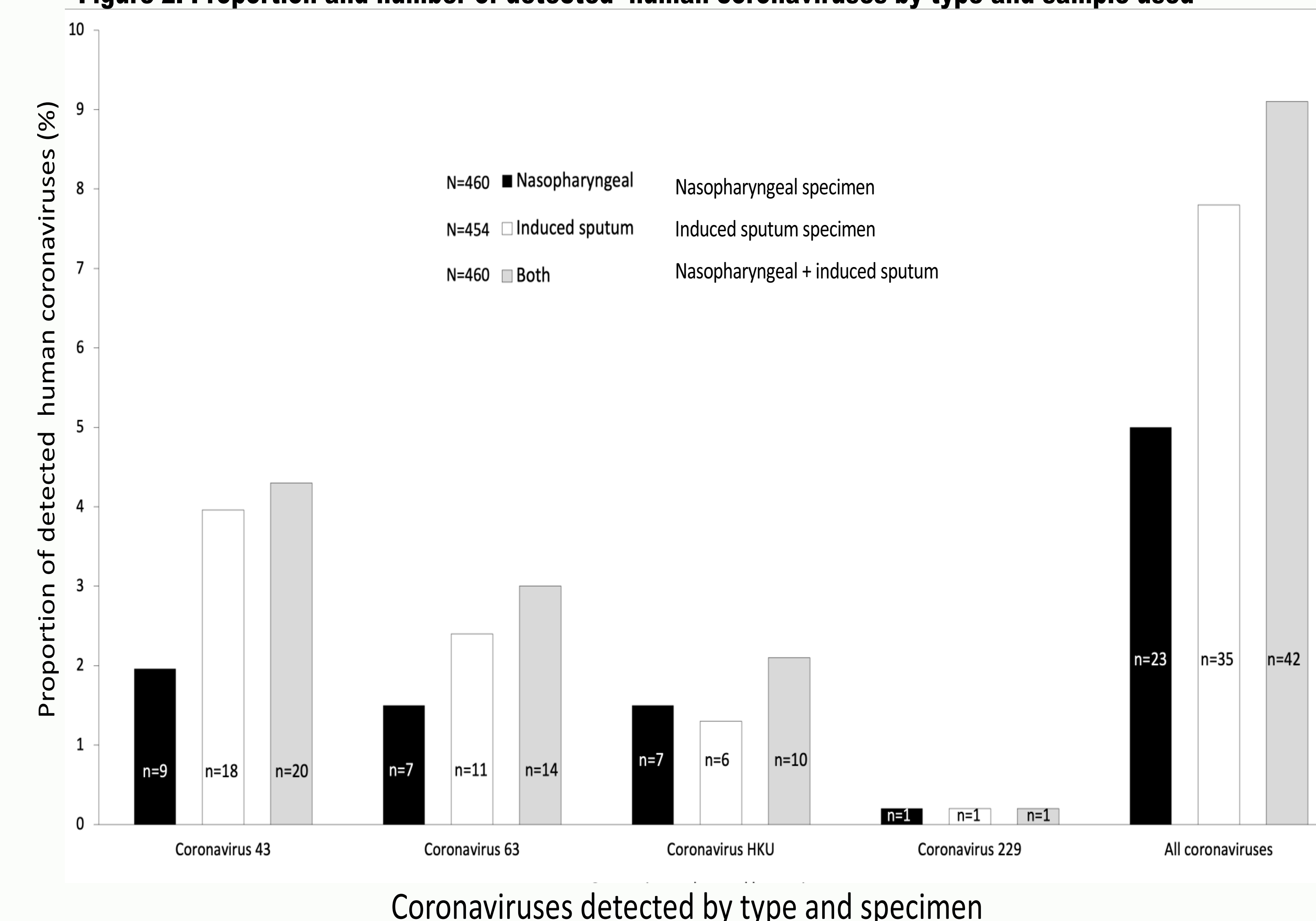
## RESULT

**Table 1 Sociodemographic characteristic of study population (N=460)**

Variable	n	%	
Sex	Male	258	56.1
	Female	202	43.9
HIV status	Uninfected	349	75.9
	Exposed but negative	92	20.0
	Infected	19	4.1
Undernourished (Z score < -2)	Yes	45	9.8
	No	415	90.2
Creche attendance	Yes	96	20.9
	No	364	79.1
Presence of home smoker	Yes	162	35.2
	No	298	64.8
Use of Fossil fuel at home	Yes	18	3.9
	No	442	96.1
Prior use of antibiotics	None	260	56.5
	Ceftriaxone	91	19.8
	Penicillin	70	15.2
	Other	12	2.6
	Unknown	27	5.9
Caregiver Relationship	Mother	450	97.8
	Father	2	0.4
	Grandmother	5	1.1
	Other	3	0.7
	Breastfeeding history	Never breastfed	60
Breastfed 1st four months		323	70.2
Breastfed > four months		77	16.7



**Figure 2. Proportion and number of detected human coronaviruses by type and sample used**



**Table 2: Potential risk factors for human coronavirus infection (N=460)**

Assessed risk factor	n	%	P value	
Sex	Male	258	23 (8.9)	0.856
	Female	202	19 (9.1)	
Age category	< 6 months	192	11 (5.7)	0.008
	6 –18 months	153	23 (15.0)	
	>18 months	115	8 (7.0)	
HIV status	Uninfected	349	30 (8.60)	0.155
	Exposed but negative	92	12 (13.0)	
	Infected	19	0 (0.0)	
Undernourished (Z score <-2)	Yes	45	3 (6.7)	0.546
	No	415	39 (9.4)	
Creche attendance	Yes	96	10 (10.4)	0.623
	No	364	32 (8.8)	
Presence of home-smoker	Yes	162	15 (9.3)	0.944
	No	298	27 (9.1)	
Use of fossil fuel at home	Yes	18	3 (16.7)	0.221
	No	442	39 (8.8)	

HCoV = Polymerase chain reaction positive for human coronaviruses

## REFERENCES

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## CONCLUSIONS

- There is a need to assess febrile convulsions / encephalopathy / croup / Kawasaki in patients to see the true HCoV disease burden
- More data conveying information about the superiority of sampling procedure is warranted