Incidence of Rubella / Congenital Rubella Syndrome cases at Port Moresby General Hospital. **Retrospective – Prospective Study**

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Introduction

- Mild disease in adults and children.
- Maternal infection in early pregnancy leads to CRS [ophthalmic, auditory, cardiac, & craniofacial defects].
- Incidence rubella 1.78 per 100, 000 population. Western Pacific region 4.08 per 100 000 population . [WHO- 2009]
- Est. >100 000 infants are born with CRS annually.
- Recent epidemics - Japan 42.5 / 100, 000 population & Poland 26, 000 cases (80% are male 29-30). [CDCP-2013]

Introduction

- About 131 (68%) [40% of birth cohort] have introduced rubella vaccine.
- Rubella vaccines is live attenuated RA 27/3 strain, highly effective & produce life long immunity with a single dose of vaccine .
  - Clinical trials have shown that > 95% of vaccinees age 1 year or more develop immunity from a single dose & > 90% have clinical protection against acute rubella for up to 15 yrs.
- PNG incidence is unknown.
- More cases – lack of awareness – under recognition and under-reporting of cases.

Aim

1. Retrospectively report on Incidence over 6 year period :
   - Clinical Confirmed Congenital Rubella Syndrome Cases (according to WHO CRS criteria) and
   - Acute Rubella Infection

2 . Prospectively over 1 year period:
   - Confirm Clinically Suspected Congenital Rubella Syndrome cases at Special Care Nursery and their serology.
   - Children with Acute Fever & Rash and their serology.

Methodology

Design/Site

Descriptive retrospective- prospective study at Port Moresby General Hospital

Time

Part A

- Retrospective study - 2006-2011 (June –December 2012)

Part B

- Prospective study (March 2012- May 2013)

Data Collection

- Admission registry
- Patient files for extra information
- Medical records

Retrospective- Inclusive Criteria

Special Care Nursery

Ear Nose Throat,

Ophthalmology,

Cardiac,

Central Public Health Laboratory

Age – 0 – 12 years

Time - 2006-2011

CRS

Clinically confirmed cases - Any 2 signs according to WHO Classification.

Acute Rubella

All positive rubella IgM

Case Definition for Retrospective CRS Study.

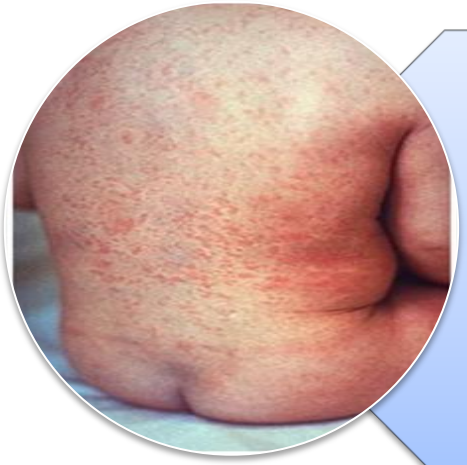
Clinically confirmed cases with least 2 of the complications listed below.

A. Cataract, congenital glaucoma, congenital heart disease, loss of hearing, pigmentry retinopathy

B. Purpura, radiolucent bone disease, jaundice that begin within 24 hours of birth.

C. Other – Microcephaly, Micrognathia , nystagmus, diminished vision, squint, mental retardations, micropthalmia, heptosplenomegaly, menigoencephalities

Prospective Study - Inclusive Criteria



Acute Rubella

Children between 1-12 years with AFR with serology (rubella IgM).

COPD, Cons clinic , General Wards

CRS

An infant born with any suspected sign of CRS admitted to SCN with their serology.

Prospective – Data & Sample Collection

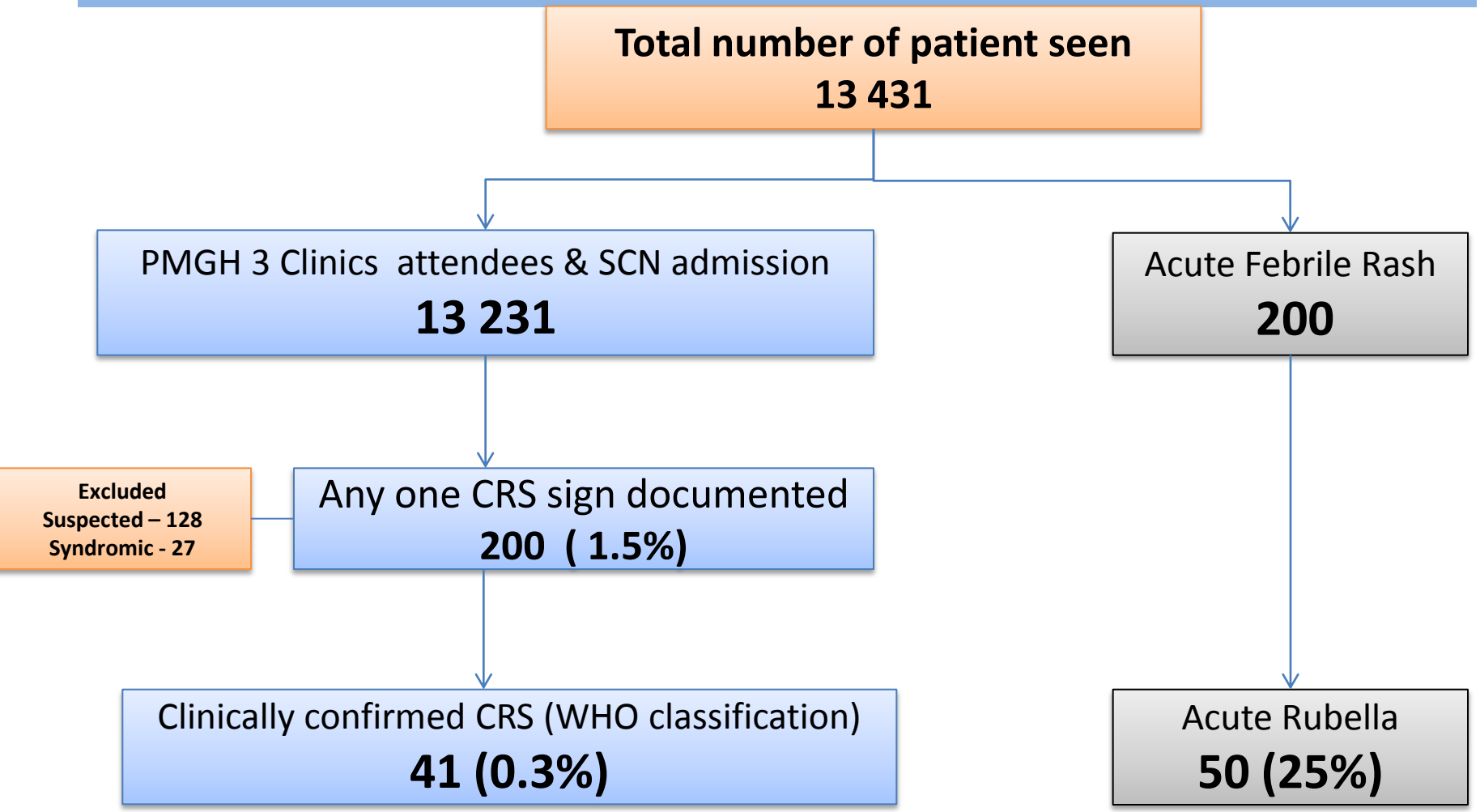
- Awareness
- Identification of cases
- Verbal consent
- Sample collection (~ 1 ml of serum in a plain bottle).
- AFR surveillance form (detailed clinical notes for all patient presenting with CRS).
- Rubella IgG/IgM antibody ELISHA test.

Data Management & Analysis

- Ethical approval – UPNG research committee.
- Data entering - Microsoft Excel 2010 .
- Further analysis- SPSS Version 19.
- Incidence rate - new cases over the total population within the given period .

Retrospective study

Overall retrospective study results.



Incidence Rate- Retrospective Study

- WHO clinically confirmed Congenital Rubella Syndrome cases accounted for 0.3% (3.05 per 1, 000) population of PMGH clinic attendees/ SCN admission.

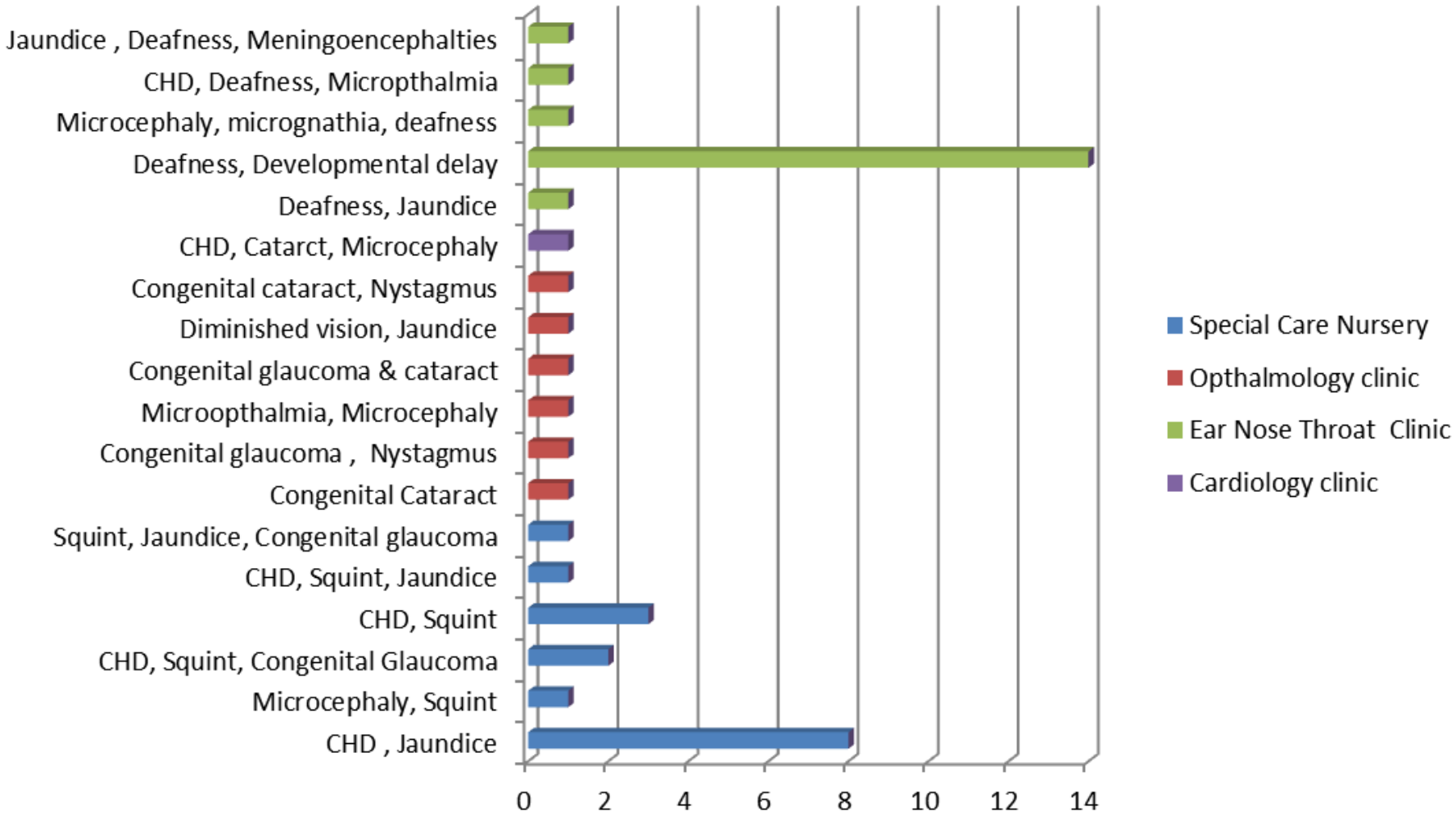
- Rubella accounted for 25% of children presenting with AFR.

Characteristics of clinically confirmed CRS cases in the retrospective study

		Number (n)	Percent (%)
Gender	Male	25	58
	Female	16	37
Origin	Southern	24	56
	Highlands	5	12
	Momase	4	9
	Islands	6	14
Gestational Age †	GA 37- <42weeks	11	27
	GA 32- <37 weeks	3	7
	GA 28- <32 weeks	1	2
	GA 20- <28 weeks	1	2
Classification of † Birth Weights	Bt. Wt. 2.5- 4kg	7	16
	Bt. Wt. 0.5- <2.5kg	9	21

†Missing datas – analyzed only available datas.

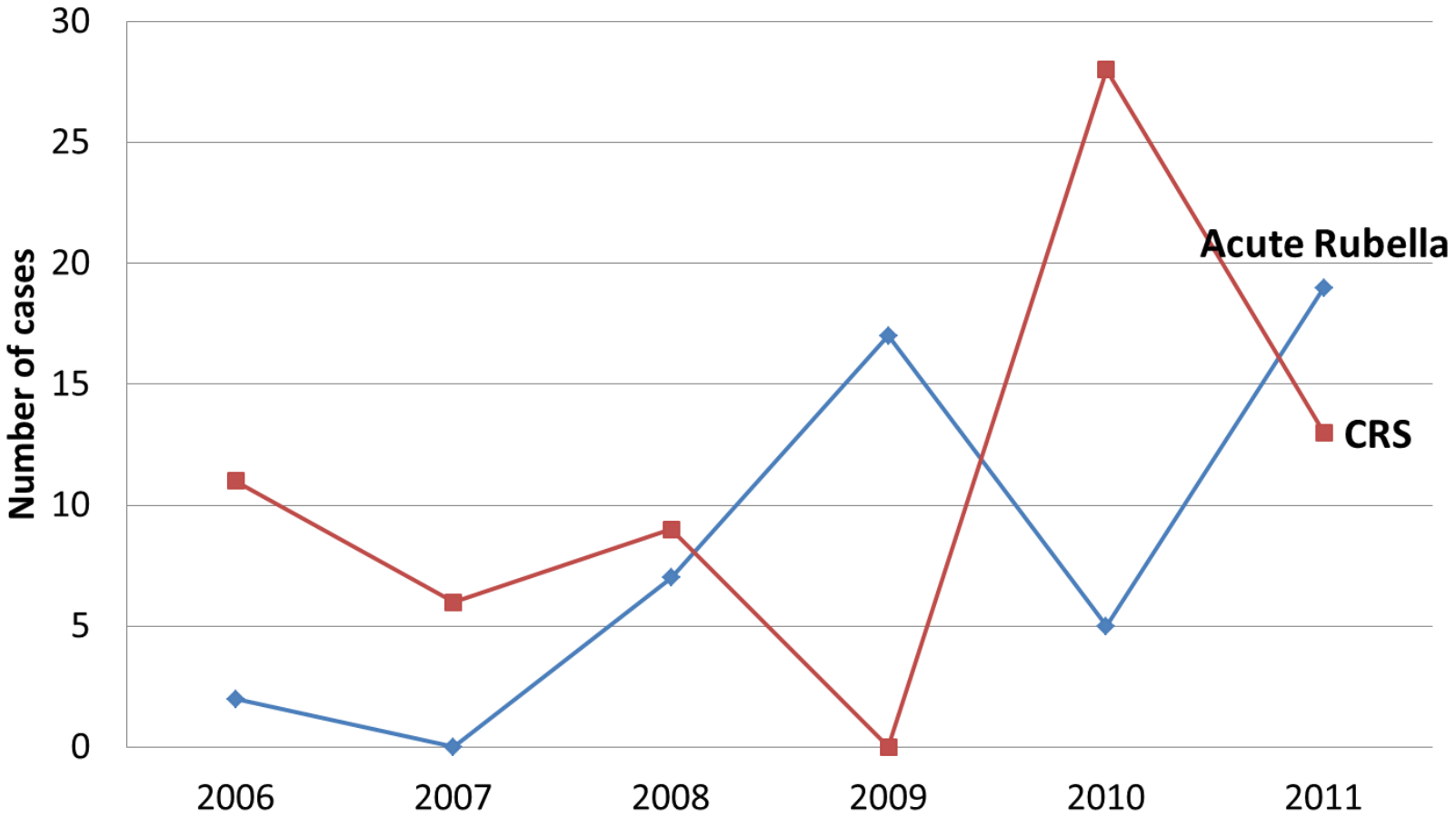
Number of clinically confirmed CRS cases in the 3 clinics & SCN - retrospective study .



Characteristics of children presenting with Acute Rubella- Retrospective Study

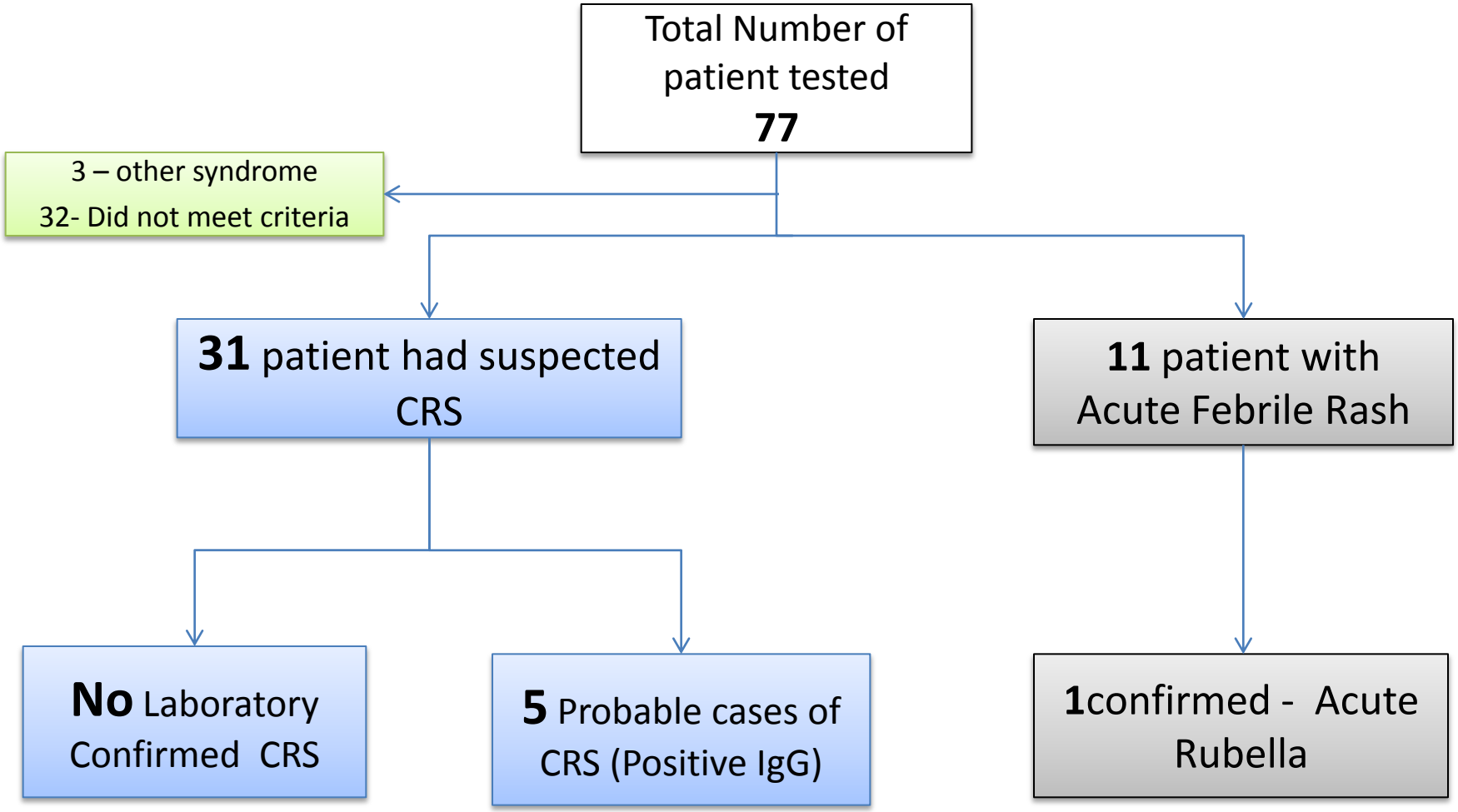
		Number	Percent	
Gender	**Male**	25	50	
	Female	25	50	
Origin	**Southern**	20	39	
	Highlands	16	30	
	Momase	5	10	
	Islands	9	17	
Year of Presentation	**2006**	2	4	
	2007	0	0	
	2008	7	14	
	2009	17	33	
	2010	5	10	
	2011	19	17	
Age	**Mean**	**Median**	**SD**	**IQR**
	5.68 (1-12)	5.00	3.34	3-8

Relationship between the Acute Rubella and CRS cases in the Retrospective study



Prospective Study

Overall Prospective Study Results



Results

About 1.7% of the total infants admitted to PMGH SCN were suspected to have CRS.

- Non Laboratory Confirmed CRS
- 5 Probable CRS cases – Rubella IgG positive

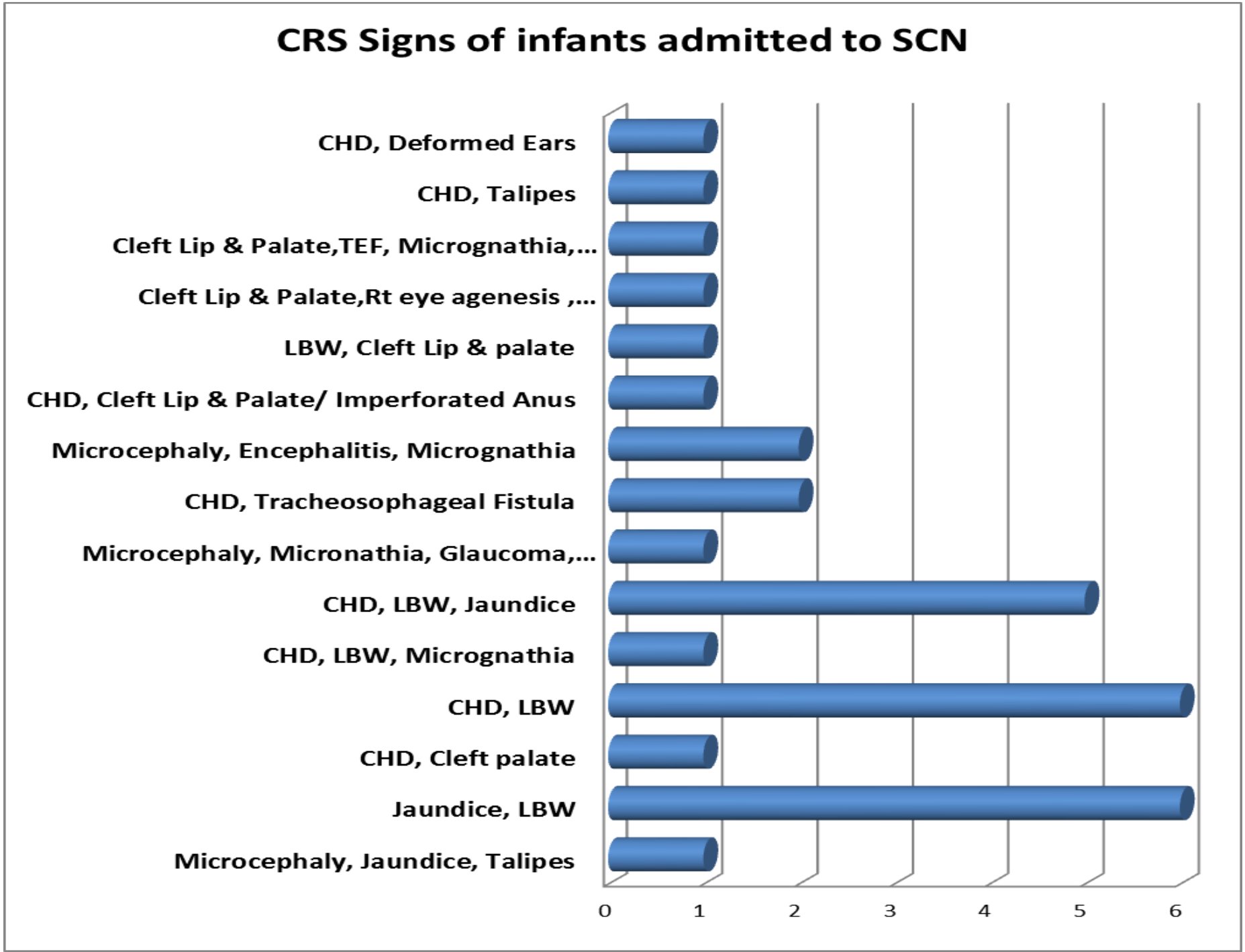
One case of Acute Rubella with AFR

Characteristics of children presenting with CRS Prospective Study

		Number	Percent
Gender	**Male**	22	71
	Female	8	26
	Unknown	1	3
Origin	**Southern**	23	74
	Highlands	5	16
	Momase	2	7
	Islands	1	3

Age, G.A & Bt. Wts of infants admitted to SCN-PMGH in Prospective Study.

	Mean	Median	SD	IQR
Age when seen (days)	6 (0- 34)	3	7.7	2- 7
Gestational Age (weeks)	36 (28-40)	37	3.5	35-39
Birth Weights (kg)	1.97 (0.85-3.8)	2.00	0.66	1.4- 2.4


CRS Signs of infants admitted to SCN
CHD, Deformed Ears
CHD, Talipes
Cleft Lip & Palate,TEF, Micrognathia,...
Cleft Lip & Palate,Rt eye agenesis ,...
LBW, Cleft Lip & palate
CHD, Cleft Lip & Palate/ Imperforated Anus
Microcephaly, Encephalitis, Micrognathia
CHD, Tracheosophageal Fistula
Microcephaly, Micronathia, Glaucoma,...
CHD, LBW, Jaundice
CHD, LBW, Micrognathia
CHD, LBW
CHD, Cleft palate
Jaundice, LBW
Microcephaly, Jaundice, Talipes
0
1
2
3
4
5
6

CRS signs of patients with positive Rubella IgG in the Prospective study.

Clinical sign	Maternal Hx.	Age (days)	Laboratory results	
			IgM	**IgG**
LBW, Jaundice, PDA	No	13	Negative	Positive
Tracheosophageal Fistula / PDA	No	7	Negative	Positive
Cleft lip/palate/LBW	No	0	Negative	Positive
Cleft lip/palate	No	8	Negative	Positive
Malformed ears/Complex CHD/Talipes	No	4	Negative	Positive

Discussion

- Retrospectively WHO clinically confirmed diagnosis of CRS accounted for 0.3% with an incidence rate of 3.05 per 1000 population of PMGH clinic attendees & SCN admission.

- World wide incidences varies (range 0.4- 2.2 /1000 live birth).

- There were more male than female and 21% were LBW and 27% were SFD.

- Majority of the CRS patients presented with deafness & metal retardation from ENT clinic.
  - *Bloom et al* (Lancert 2005- Morocco) showed of the 225 cases of clinically confirmed rubella cases, 129 cases had deafness and metal retardation.

Discussion

- Acute Rubella accounted for 25% of patient presenting with AFR.
- There was equal number of M:F ratio with median age of 5.6 years (IQR of 3-8 years)
- No significant relationship noted between the number of rubella & CRS cases in the retrospective arm of the study.

Discussion

- Prospectively the study showed that 1.7 % of total infants admitted to PMGH SCN were suspected to have CRS.
- More M>F and the mean age which they presented was 6 days (IQR 2-7 days) with bt. Wt. 1.97kg (IQR 1.4-2.4 kg)
- Non of this infants that were admitted to SCN over 1 year period had Laboratory confirmed CRS.

Discussion

- Five probable cases of CRS who had positive IgG with a suspected CRS sign.

- Non of their mothers had rubella vaccine or had signs of AFR during pregnancy.

  - Lab. Confirmed CRS= Positive IgM (IgM is detectable in 100% of CRS cases at birth & declines by 50% at 12mnths & rarely detectable by 18 mnths)
  - Positive IgG indicates maternal infection .

- Only one case of Acute Rubella with AFR.

Study Limitations

Poor Data Management

- Poor recording systems
- Non availability of AFR Surveillance forms
- AFR forms not completely filled out.
  - (80% incomplete, 3 % blank) (J.Kumbu)

Low awareness on Disease

- Missing out on cases

Small sample size in the prospective study.

Study limited to Port Moresby

Conclusion

- Possible probable CRS cases noted.
- Acute Rubella is a major contributor to AFR at PMGH – (?)- vaccine.
- Using retrospective approach the study showed higher incidence rate however this might not reflect true CRS burden.
- Increase awareness, surveillance & Serology confirmation to identify the true burden of rubella in PNG.
- Improving Data Management (congenital defect registry data/ neonatal check list).
- Similar study in other provinces, increase sample size.

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Reference

- S.E Reef, P Strebel, A Dabbagh, M . Gacic & S Cochi. Progress towards control of rubella & Prevention of CRS- World wide, 2009. *JID 2011: 204*

- Sharon Bloom. et al. Congenital rubella syndrome burden in Morocco: A rapid retrospective assessment, *Lancet* 2005: 365: 135-41.

- Nationwide rubella epidemic , Japan 2013, Centre of Disease Control and Prevention.