Trends in birthweight among four tribal communities in rural Tamil Nadu, India

Abstract

This study sought to describe trends in birthweights over time among rural, tribal populations in South India. Data was collected on 2873 deliveries taking place in an area of rural Tamil Nadu, India, between March 2004 and March 2013. From these, trends in birth-weight; overall and by tribe were worked out, as well as trends in, and proportions of, babies born at Low Birthweight and Very Low Birthweight, overall and by tribe. Finally, delivery location, overall and by tribe, was described. Overall, three of the four tribes showed an improvement in birthweight over time- however, this is still an area that would benefit from targeted interventions to improve birthweights.

Introduction

Background

Indigenous populations, or Adivasis, in India, traditionally have poor health outcomes and higher morbidity and mortality than non-tribal populations. The Adivasis of the Gudalur valley, Tamil Nadu, number approximately 25,000 and are comprised of 5 distinct groups: the Paniyas (P), Kattunaikans (KN), Mullakurumbas (MK), Bettakurumbas (BK) and Irulas (I). The Gudalur Adivasi Hospital (GAH) provides curative and preventive health care services free of charge to Adivasi people in this area.[1] This study, undertaken at the GAH, seeks to establish the current state of birthweights as an indicator of health amongst four of these tribal populations.

Objectives

The objectives of this study were as follows:

- Compile data on birthweights according to the tribes in the area from the beginning of records (March 2004) to present day (March 2013).
- Map trends in birthweight, overall and by tribe
- Analyse trends in delivery location, overall for the area and by tribe
- Present a formal report detailing the results, in order to inform future service evaluation and targeted interventions aiming at improving birth-weights and increasing the proportion of institutional deliveries in the tribal communities

Methods

Study Design

This is an observational, population based study.

Study Setting

The study took place in the catchment area of the Gudalur Adivasi Hospital, near Gudalur, Nilgiris District, Tamil Nadu, India.

Participants

All babies recorded in the area centre records were included regardless of whether a full data set was available.

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[1] Mohankumar, A. “Health status of an indigenous population in India receiving preventive and curative health care services”, 2009, http://www.ashwini.org/documents/MortalityAndMorbidity.pdf.

Variables

Primary outcome measured was birthweight, using WHO classification:

- normal birthweight (N): ≥2.5kg
- low birthweight (LBW): <2.5 kg
- very low birthweight (VLBW): <1.5 kg
- abortion: in this case, used synonymously with miscarriage. There were no recorded incidences of medical termination of pregnancy.

Secondary outcome recorded was location of delivery:

- Gudalur Adivasi Hospital (GAH)
- Government Hospital
- Home
- Other

Data Sources/Measurement

All data was derived from Area Centre records kept at the GAH. Data from 2004-March 2010 was available in Excel spreadsheets; from April 2010- March 2013 data was manually entered by researches into an identical Excel format.

Study Size

The study size was limited to include all babies born between March 2004 and March 2013 for whom records were available, regardless of whether information on study outcomes was available. The Irula tribal population were excluded (4 babies; 0.01% of study population).

Results

Participants

2873 deliveries were recorded. Of these, 4 were excluded as they did not form part of the study population. 621 Bettakurumba, 520 Kattunaikan, 155 Mullakurumba and 1573 Paniya babies were analysed. Birthweights were not included (if mentioned) on deliveries termed “abortion”.

Descriptive Data

621 Bettakurumba, 520 Kattunaikan, 155 Mullakurumba and 1573 Paniya babies were included in the study. Birthweight data was missing for 93 Bettakurumba, 91 Kattunaikan, 8 Mullakurumba and 322 Paniya deliveries.

Outcome data

2873 deliveries were recorded. Of these,

- 514 had no birthweight data,
- 1386 were Normal Birthweight,
- 812 were Low Birthweight,
- 60 were Very Low Birthweight
- 97 were abortions (birthweight not applicable).

Main Results

Primary Outcomes

Overall

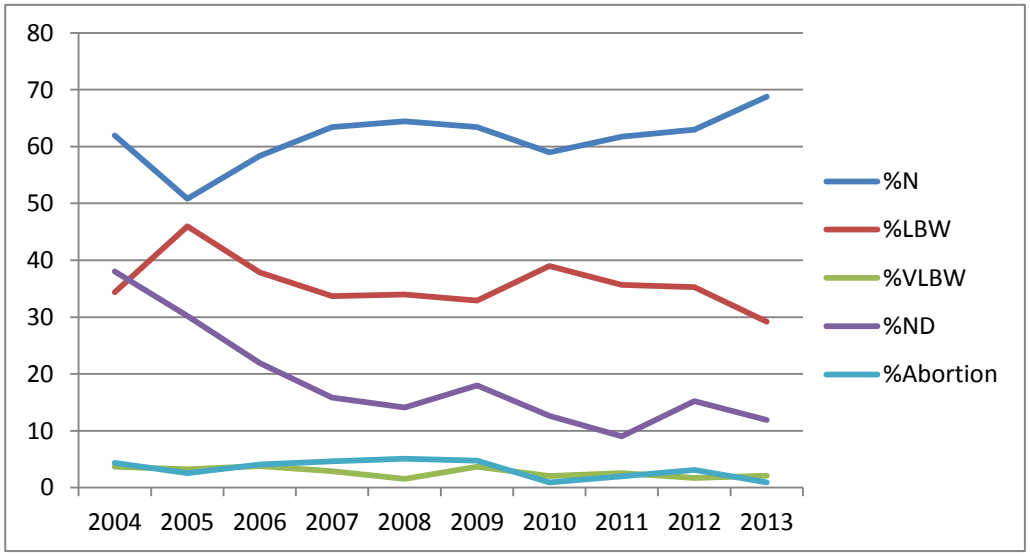
The average birthweight for the 4 tribes combined has remained fairly static, at between 2.21 kg and 2.53 kg from 2004 to 2013; the overall average being 2.434 kg (this falls into the WHO classification category of Low Birthweight). The average for the other categories similarly remained static.

Figure 1.1. Overall birthweights.(kg)

Average	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	*Overall*
Birthweight	2.46	2.21	2.47	2.46	2.53	2.46	2.38	2.47	2.43	2.47	*2.43*
Normal (N)	2.74	2.67	2.78	2.71	2.75	2.73	2.68	2.73	2.66	2.66	*2.71*
Low (LBW)	2.13	2.07	2.14	2.12	2.13	2.10	2.07	2.11	2.08	2.12	*2.11*
Very Low (VLBW)	1.31	1.35	1.24	1.22	1.41	1.14	1.23	1.20	1.05	1.23	*1.24*

The percentage of babies with normal birthweight is increasing, while numbers of low birthweight, and those with no data are falling. Percentages of pregnancies resulting in abortion, or in very low birthweight babies, remain static.

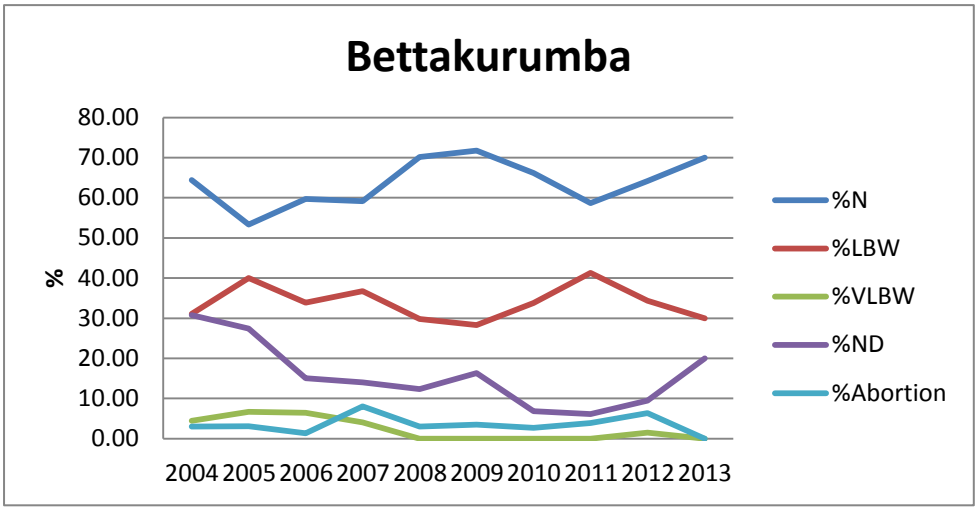
Figure 1.2 Trends in overall birthweights



Bettakurumba

There is a general improvement in numbers of normal birthweight babies: 64% of all births in 2012. Low birthweight and very low birthweight accounted for 34% and 1.5%, respectively.

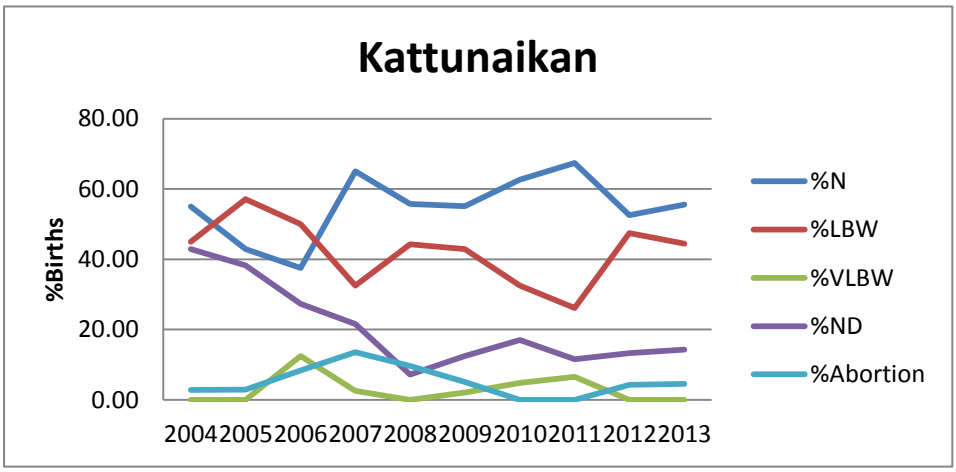
Figure 1.3 Trends in birthweight over time, BK



Kattunaikan

There is no clear improvement over the study period. 52.54% of births are classified normal birth-weight, with 47.46% low birth-weight in 2012. The average birth-weight is 2.30 kg.

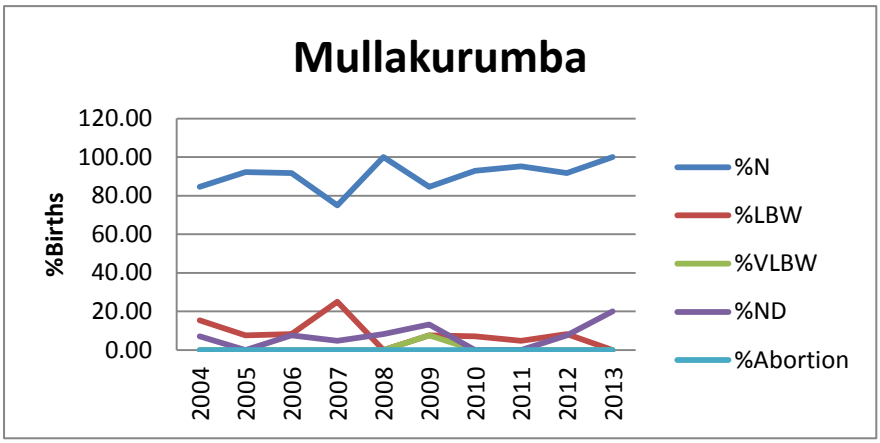
Figure 1.4 Trends in birthweight, KN tribe



Mullakurumba

The MK tribe shows consistently good results. In 2012, 91.67% of babies were born at normal birthweight, with only 8.33% low birthweight. Only one baby was born at very low birthweight during the study period. Indeed, if Mullakurumba data is excluded, the overall birthweight average drops to 2.39kg from 2.43 kg (a 1.6% drop).
It is worth noting that significantly fewer MK women delivered in the area than those of other tribes.

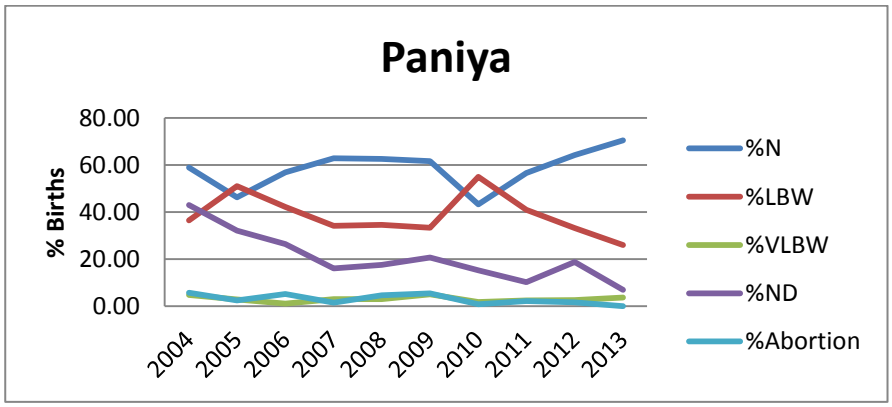
Figure 1.5 Trends in birthweight: MK



Paniya

There is some improvement over time: In 2004 58.82% of Paniya babies were born at normal birthweight, increasing to 64.24% in 2012. Low birthweights accounted for 33% in 2012.

Figure 1.6 Trends in birthweight, P



Secondary Outcomes

Place of delivery

For the purpose of this report we concentrated on deliveries taking place in the home, the Gudalur Adivasi Hospital, and the local Government Hospital.

Institutional deliveries are strongly encouraged by the Indian government. 55% of deliveries in the study period took place at the GAH, 4% at the local government hospital and 32% in the home.

Figure 2.1 Proportions in site of delivery

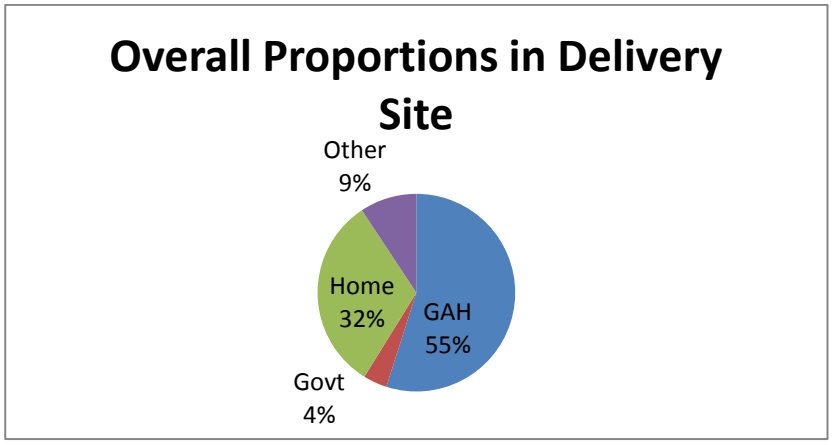
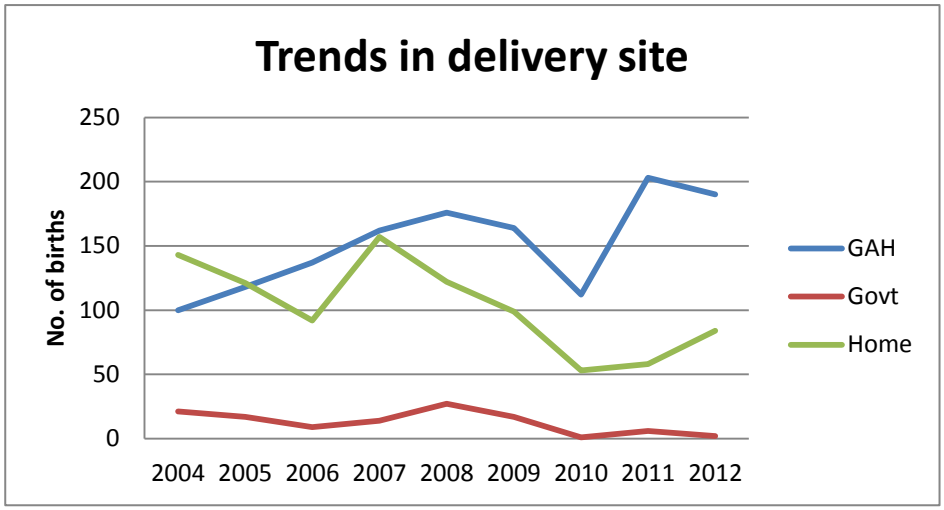


Figure 2.2 Trends in delivery site (excluding 2013)



Bettakurumba

BK deliveries are predominantly institutional, and overall this is an increasing trend.

Figure 2.3 Delivery site, BK

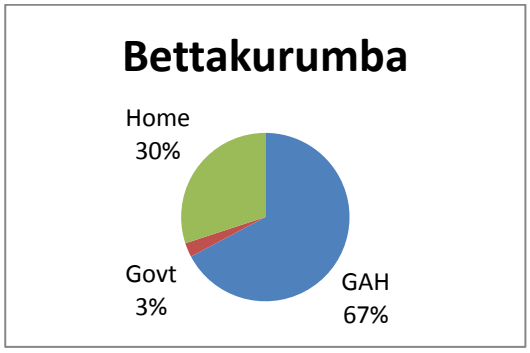
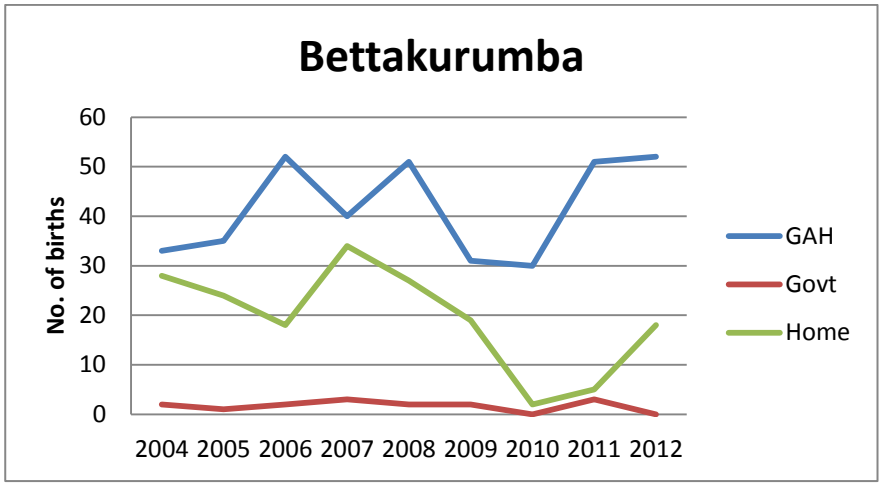


Figure 2.4 Trends in delivery site, BK



Kattunaikan

Almost half of all KN deliveries take place in the home, and this figure is not obviously decreasing.

Figure 2.5 Proportions of delivery site, KN tribe

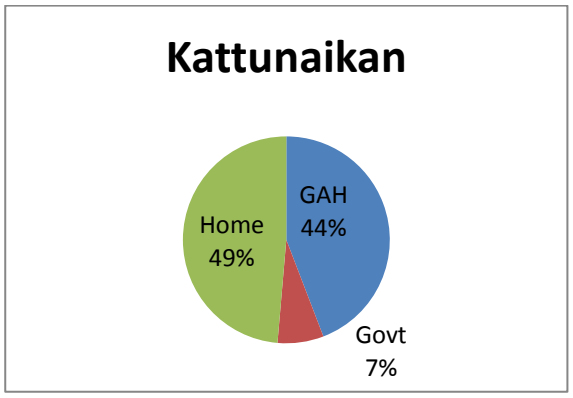
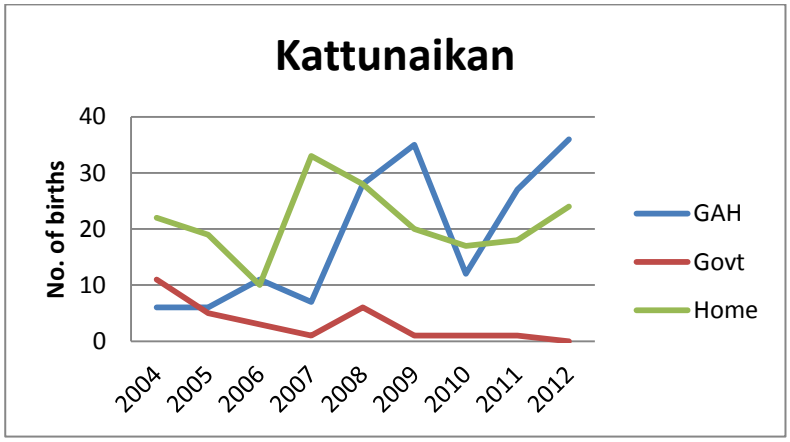


Figure 2.6 Trends in delivery site, KN tribe



Mullakurumba

Although trends show MK deliveries to be falling, this is more likely to reflect MK mothers delivering outside study locations. There is a virtual absence of home deliveries in this community.

Figure 2.7 Delivery sites, MK tribe

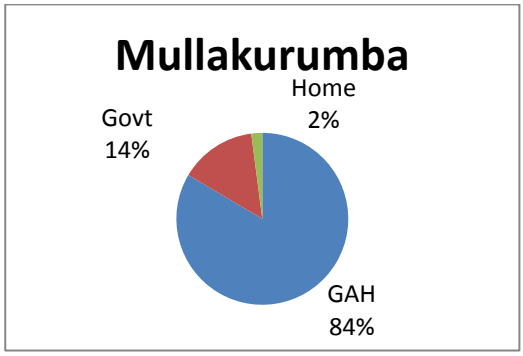
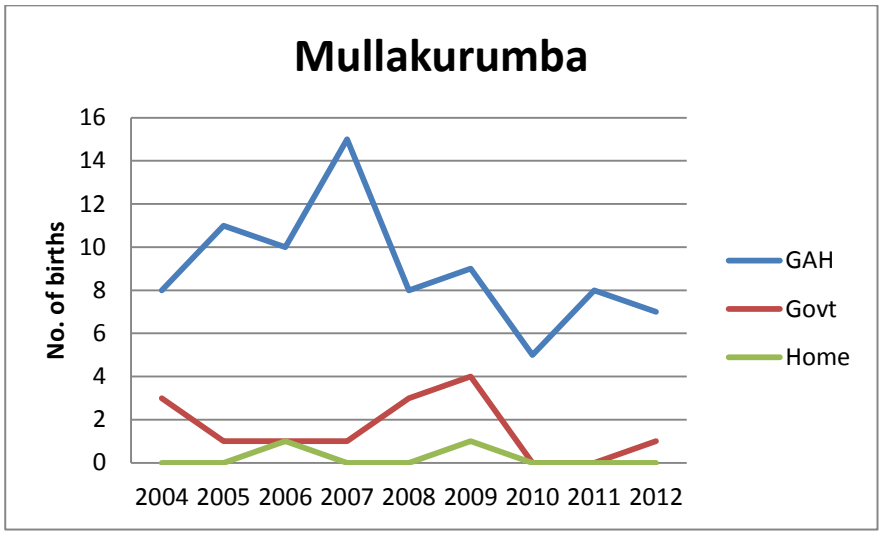


Figure 2.8 Trends in delivery site, MK tribe



Paniya

Just over half of Paniya deliveries take place in institutions, and this is increasing.

Figure 2.9 Delivery site, P tribe

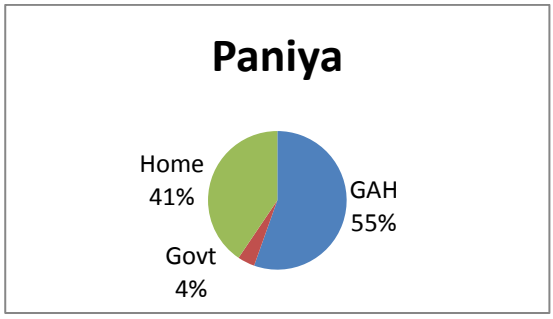
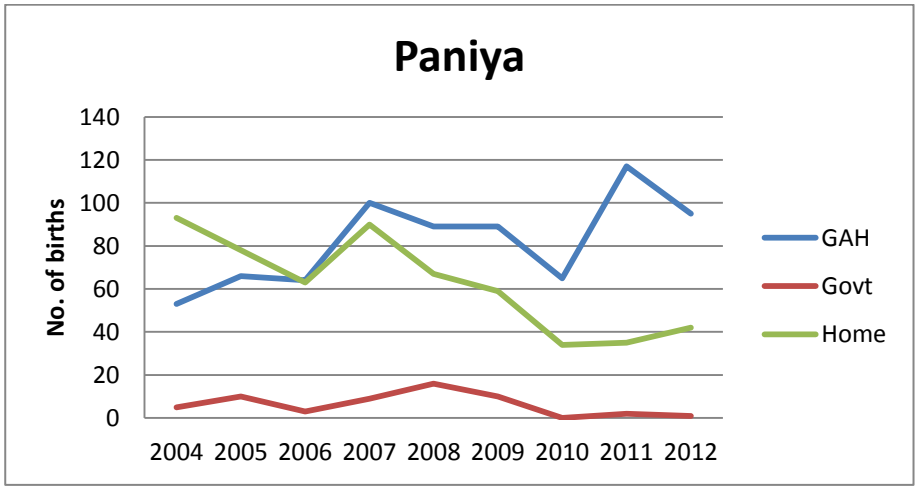


Figure 2.10 Trends in delivery site, P tribe



Discussion

Key Results

Overall, birthweights amongst the tribal population in this area have improved slightly over time, and normal birthweight babies now account for almost 70% of all births in the area. BK, MK and P tribes all show improvements, achieving 64%, 92% and 59% normal birthweights in 2012 respectively, and only KN communities show no steady increase in the number of babies born at normal birthweight (55% in 2004, 55.6% in 2012).
Despite improvements, however, the overall average birthweight remains "low", at 2.43kg.

Concerning place of delivery, improvements are also seen. The BK, KN, MK and P tribes have 70%, 51%, 98% and 59% institutional deliveries respectively; again, all show an improvement over time except the KN tribe.

Limitations

The main limitation of the study consisted in very limited information on gestation of babies. We do not know what proportion of babies were born prematurely, as this was often not filled out in the area centre records.
We have hence analysed all deliveries without reference to gestation, and overall birthweights may in fact be more favourable if pre-term babies could be excluded.

Interpretation

Overall, birthweights in these populations are improving over time, except for the KN tribe. Targeted efforts may be needed in order to bring about further improvements in this area.

A positive trend is also noted in relation to our secondary outcome. Institutional deliveries are, overall, increasing in this area. Efforts to encourage this trend might prove valuable, especially for the KN tribe.

Other information

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