

IODINE NUTRITIONAL STATUS AMONGST NEONATES OF UTTARAKHAND, INDIA



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INTRODUCTION

Iodine deficiency among neonates is one of the most common preventable causes of mental retardation. Uttarakhand state is endemic to Iodine Deficiency.

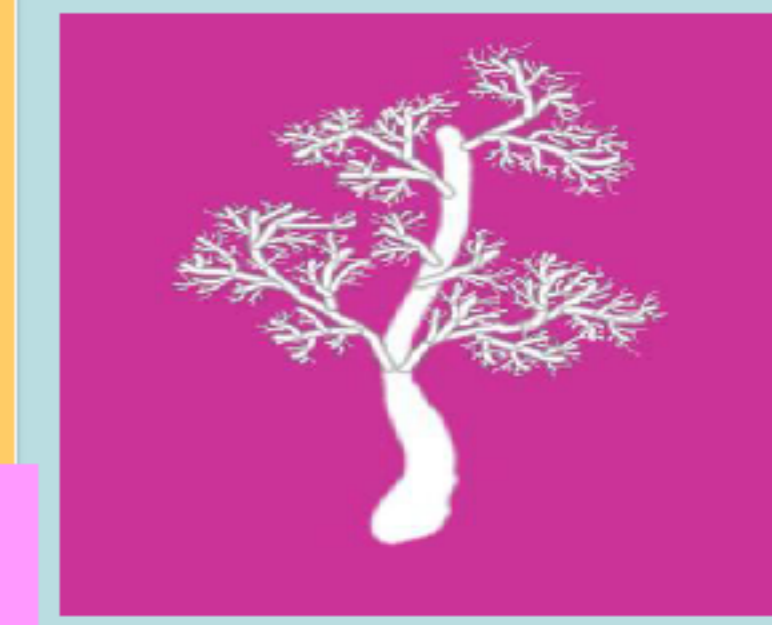
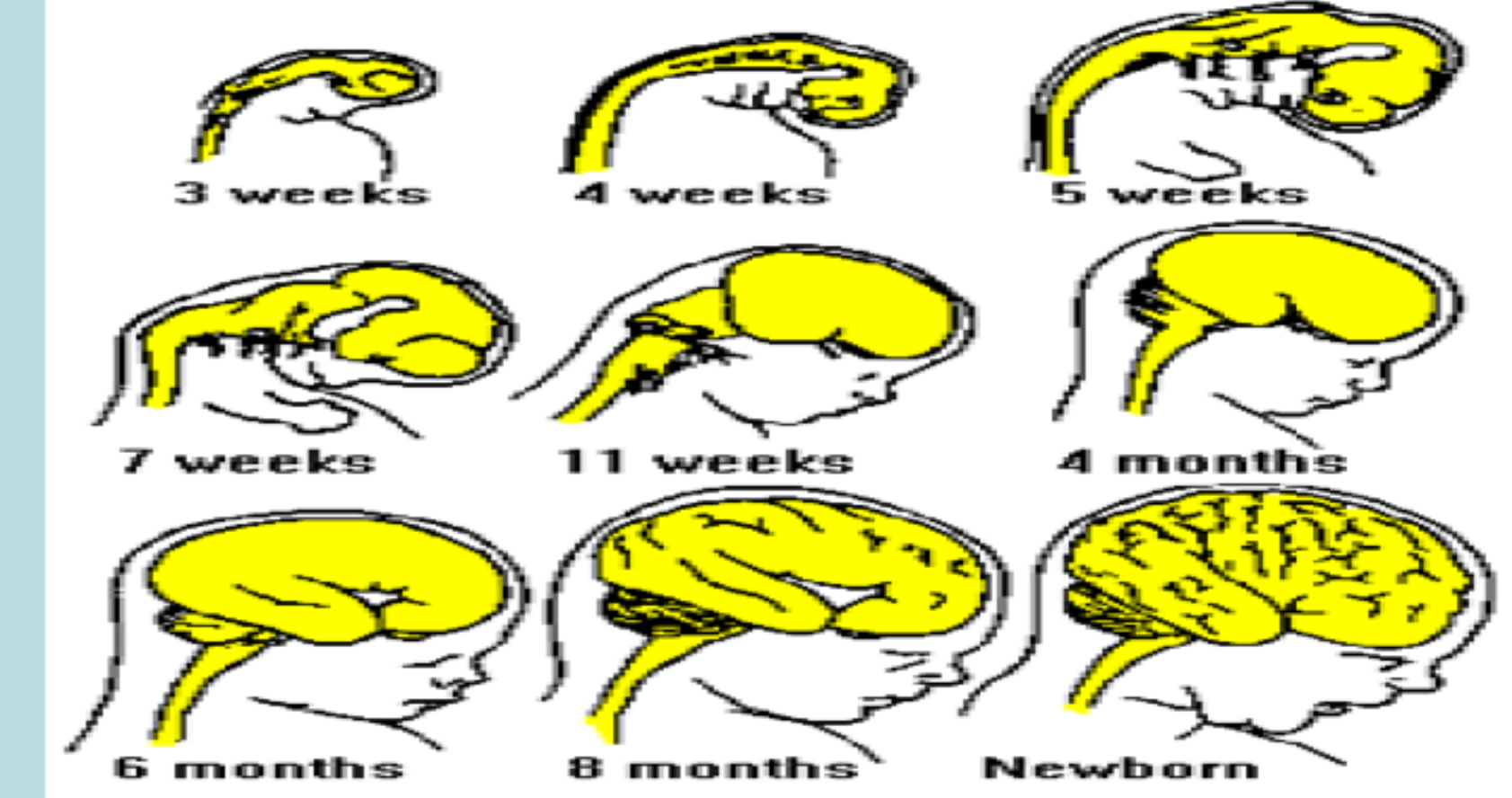


Iodine and Brain Development

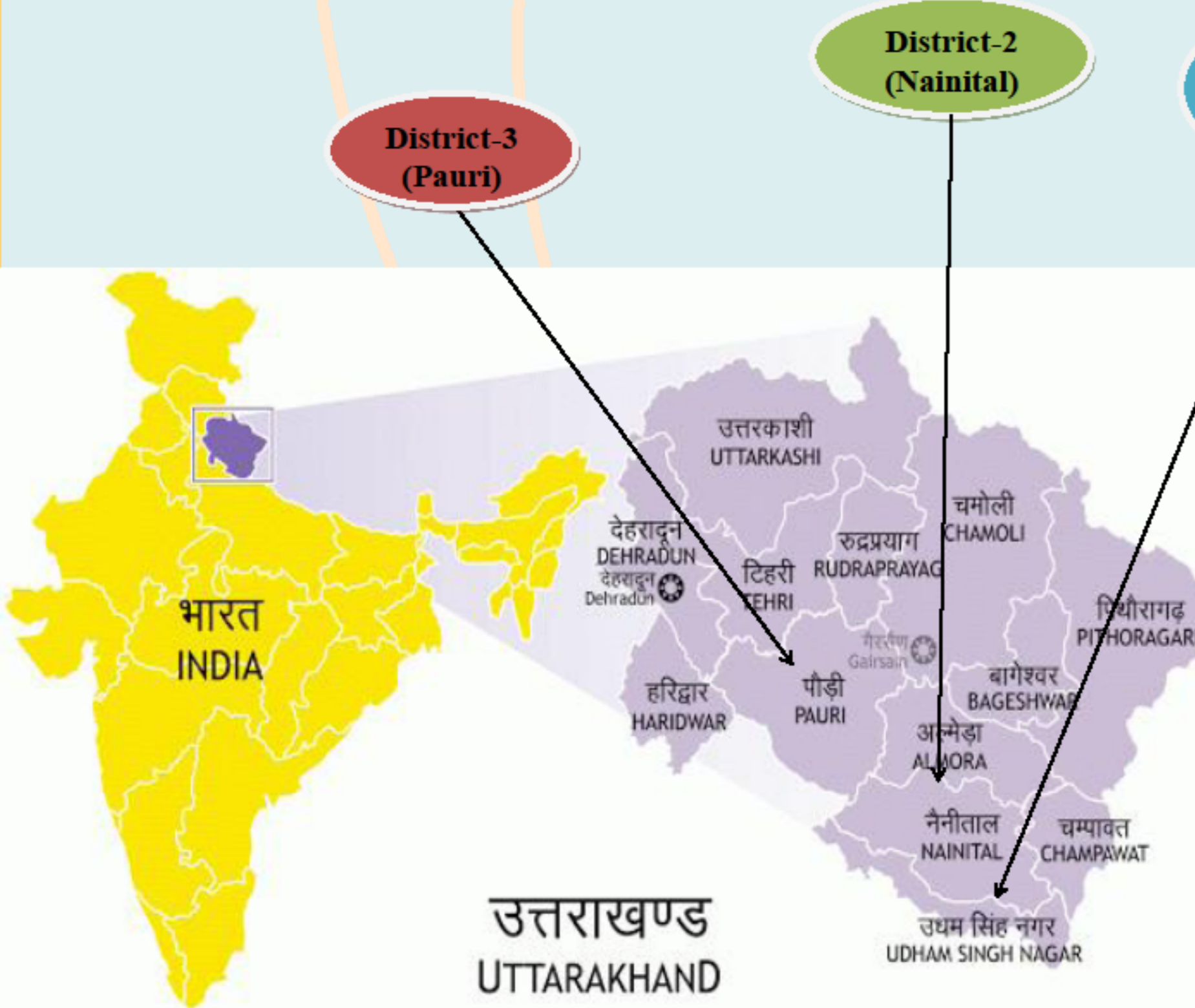
90 % of human brain development occurs between 3rd month of pregnancy & 3rd year of life (Critical period)

Deficiency of iodine during this critical period of development results in Permanent Brain Damage

This brain damage can primarily be prevented by correcting iodine deficiency before and during pregnancy



- Diminished brain cell branching due to iodine deficiency
- Diminished branching → Less connections → Lower IQ



Iodine deficiency in pregnancy = Less available to fetus.
↓
Decreased synthesis of Thyroxin.
↓
Prevents the normal development of fetal brain and body
↓
Neonatal-chemical Hypothyroidism
↓
Limits Intellectual growth
↓
Fetal brain damage (irreparable)

RESULTS

Table 1: Health Institutions included in Districts Udham Singh Nagar (n=649), Nainital (n=670), Pauri Garhwal (n=694)

Udham Singh Nagar		Nainital		Pauri Garhwal	
Hospital Names	N(%)	Hospital Names	N(%)	Hospital Names	N(%)
District Hospital Rudrapur	209 (32.2)	District Hospital Nainital	60(8.9)	District Hospital Pauri	149 (21.5)
CHC, Khatima	60 (9.3)	CHC Bhimtal	36 (5.4)	CHC, Pabau	50 (7.2)
CHC, Gadarpur	50 (7.7)	CHC, Kaladungi	50 (7.5)	CHC, Patisain	49 (7.1)
CHC, Kashipur	170 (26.2)	CHC, Ramnagar	188 (28.0)	CHC, Satpuli	39 (5.6)
CHC, Kichha	80 (12.3)	CHC, Kotabagh	49 (7.3)	CHC, Kotdwar	357 (51.4)
CHC, Sitargunj	80 (12.3)	CHC, Haldwani	287 (42.8)	CHC, Rikhnikhil	50 (7.2)
	649		670		694

Table 2: Distribution of Neonates according to TSH Levels in Districts Udham Singh Nagar (n=649), Nainital (n=670), Pauri Garhwal (n=694)

TSH Levels	Udham Singh Nagar	Nainital	Pauri Garhwal
	N (%)	N (%)	N (%)
Less than 5µIU/mL	290(44.7)	158(23.6)	189(27.2)
5- <10µIU/mL	214(33.0)	241(36.0)	215(31.0)
10 -<20µIU/mL	125(19.3)	250(37.3)	241(34.7)
20 and above µIU/mL	20(3.0)	21(3.1)	49(7.1)
Total	649	670	694

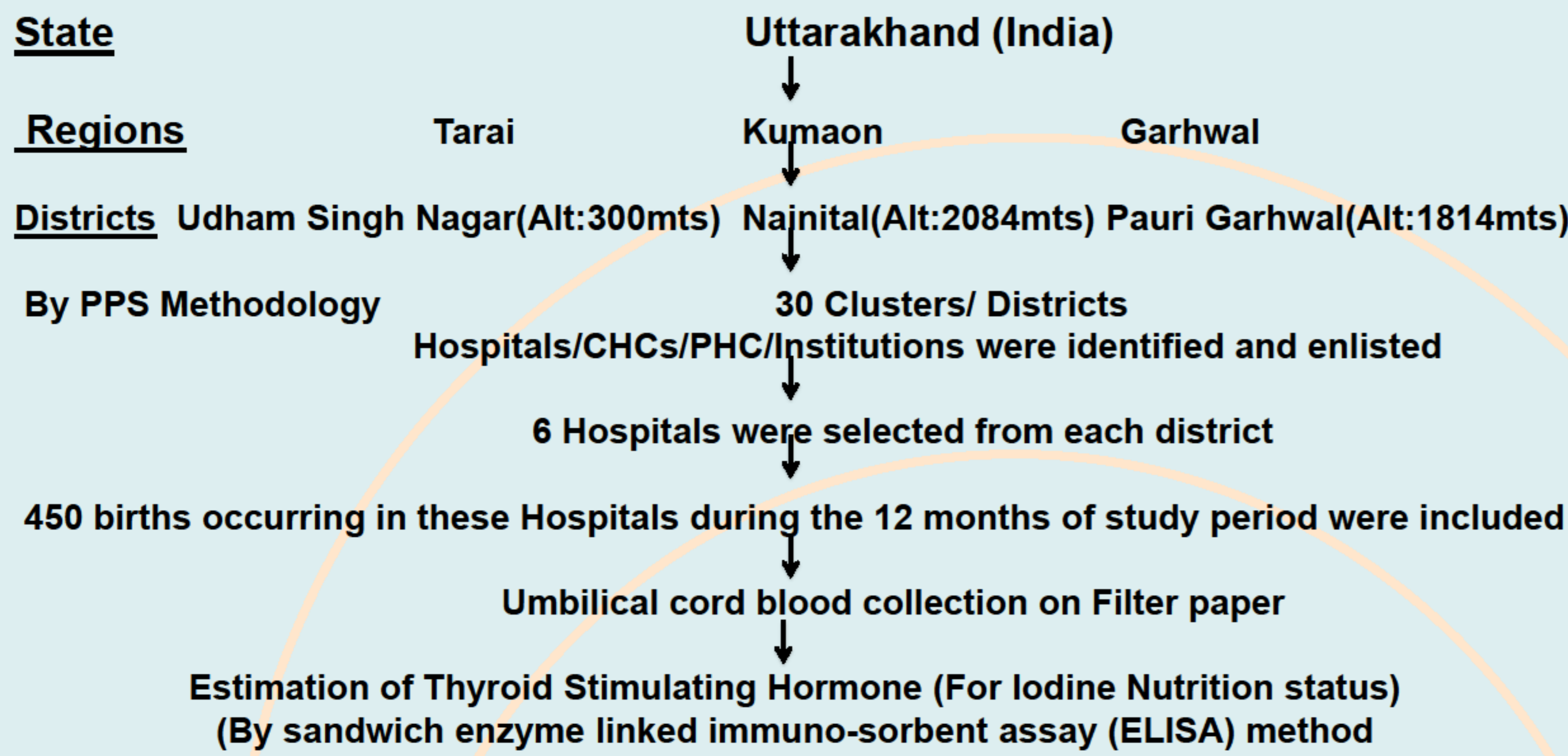
Table 3: Parameters affecting TSH levels on Screening in Districts Udham Singh Nagar (n=649), Nainital (n=670), Pauri Garhwal (n=694)

	Parameter	Number	Mean TSH (mIU/ml)	p-value
Udham Singh Nagar	Birth Weight (<2.5kg Vs ≥2.5kg)	70;579	8.1(5.6); 6.8(5.5)	0.05
	Sex (Male Vs Female)	351;298	7.4(5.6); 6.9(5.1)	0.38
	Gestational Age (Preterm Vs Term)	503;146	7.0(5.2); 7.9(6.0)	0.20
Nainital	Birth Weight (<2.5kg Vs ≥2.5kg)	52;618	2.5(6.4); 10.7(6.2)	0.01
	Sex (Male Vs Female)	330;340	10.3(6.9); 9.7(6.2)	0.32
	Gestational Age (Preterm Vs Term)	395;275	9.6(6.1); 10.6(7.1)	0.09
Pauri Garhwal	Birth Weight (<2.5kg Vs ≥2.5kg)	50;644	9.9(6.8); 10.1(6.8)	0.75
	Sex (Male Vs Female)	360;334	10.1(6.8); 10.1(6.9)	0.85
	Gestational Age (Preterm Vs Term)	246;448	8.7(6.9); 10.9(6.7)	0.001

OBJECTIVE

To assess the iodine nutritional status among Neonates of Uttarakhand state, India.

METHODS



Inclusion criteria: The Births occurring in the Hospitals/CHCs/PHC/ Institutions during the study period

Exclusion criteria: Newborns with delivery in which iodine preparations have been used and Cesarean Delivery

CONCLUSIONS

WHO (2007) reported that, a <3% frequency of TSH concentrations above 5mIU/L in samples collected 3–4 days after birth indicates iodine sufficiency in a population.

The findings of the present study found that 55.3% (Udham Singh Nagar), 76.4% (Nainital) and 72.8% (Pauri Garhwal) of the neonates had TSH levels of more than 5mIU/L, thus indicating ID in the population studied.

District Nainital reported higher prevalence of ID amongst neonates compared to other two districts surveyed may be due to its higher altitude.

Iodine deficiency continues to be a public health problem in Uttarakhand, India. There is a need to review the implementation of the iodized salt programme in Uttarakhand state. Furthermore, there is an urgent need for a neonatal screening programme for early detection of children with ID.

ACKNOWLEDGEMENT

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