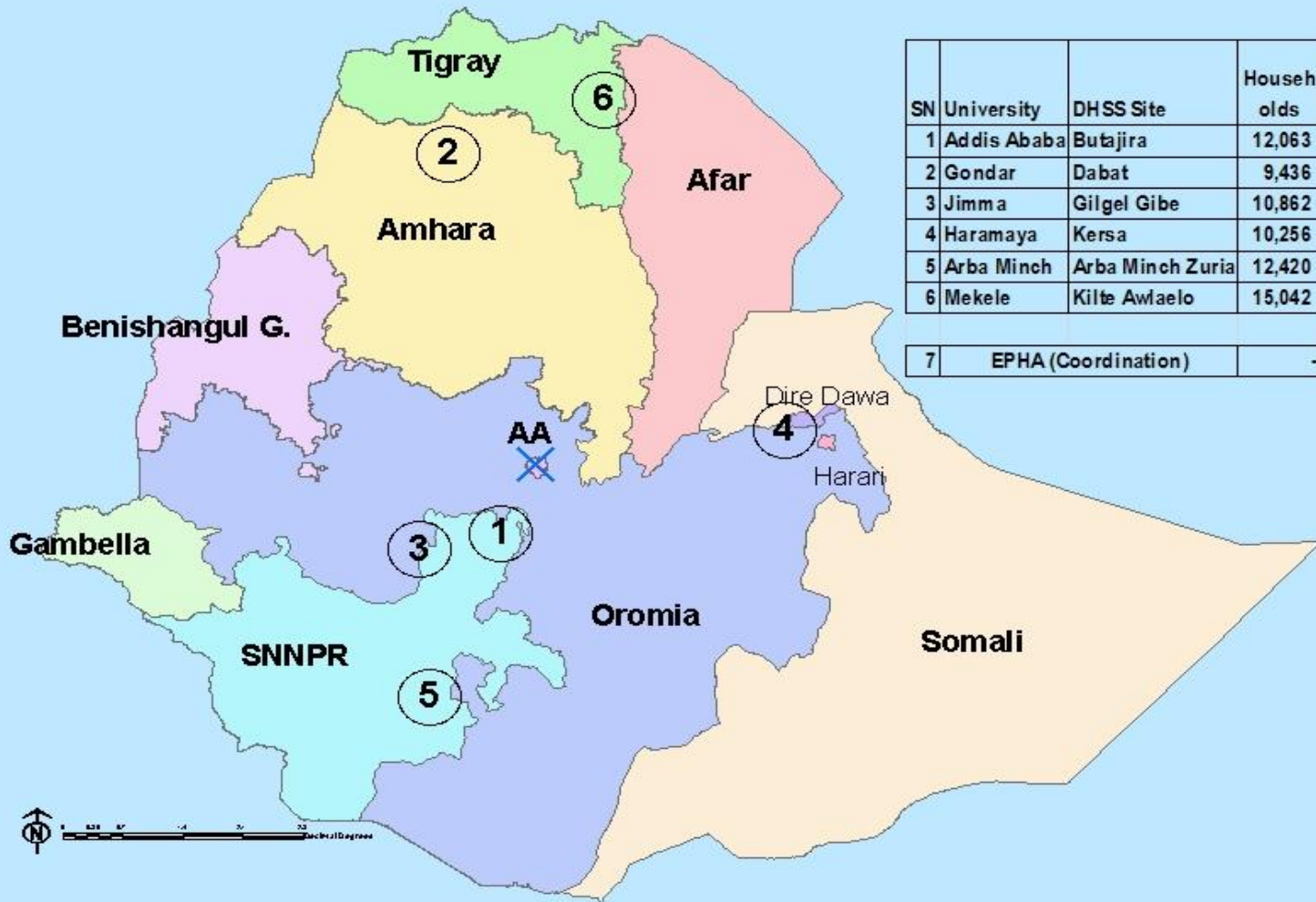


* Maternal and Child Death Rates Maternal and Child Causes of Death: Verbal Autopsy Method

1. Butajira, AAU
2. Dabat, UoG
3. Gilgel Gibe, JU
4. Kersa, HU
5. Kilde Awlalo, MU
6. Arba Minch, AMU

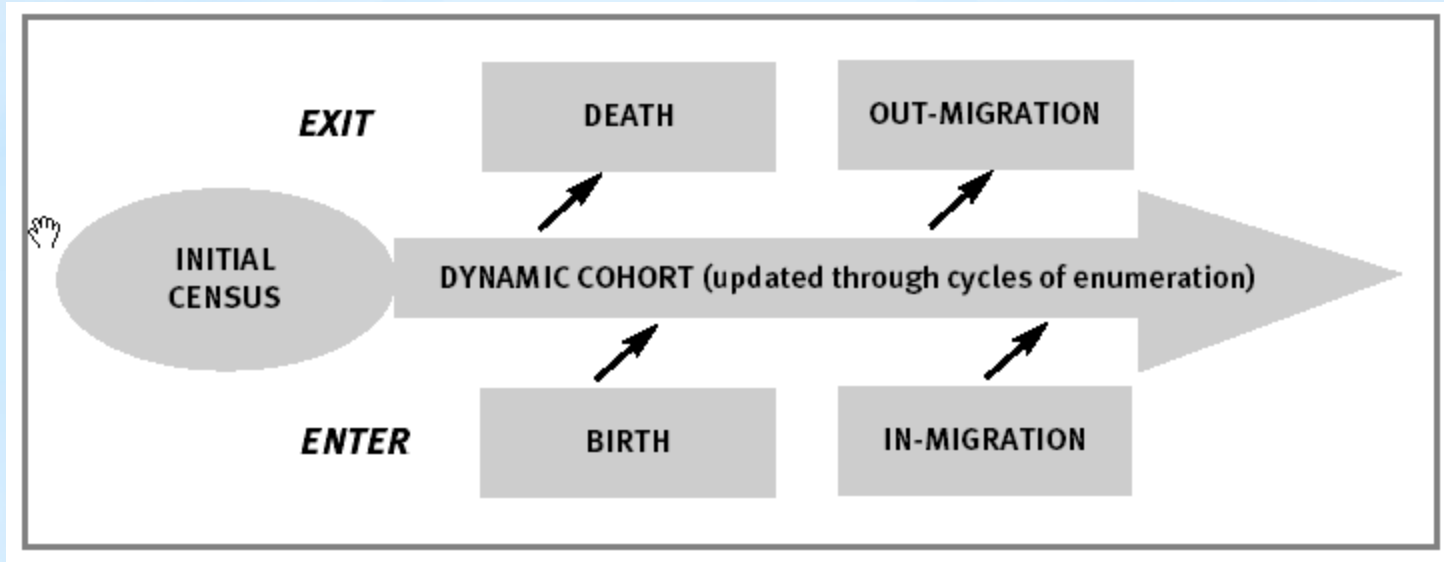
Health and
Demographic
Surveillance Sites

**Nega Assefa,
Haramaya University**



SN	University	DHSS Site	Households	Distance from AA (Km)
1	Addis Ababa	Butajira	12,063	135
2	Gondar	Dabat	9,436	821
3	Jimma	Gilgel Gibe	10,862	260
4	Haramaya	Kersa	10,256	481
5	Arba Minch	Arba Minch Zuria	12,420	505
6	Mekele	Kilte Awlaelo	15,042	822
7	EPHA (Coordination)		-	-

* Location of Ethiopian HDSSs



- * Monitoring of demographic and Health changes
- * Identifying causes of death using VA

* HDSS activities

- * Identifying cause of death is necessary for planning, and programming health interventions
- * Such information is difficult to find in the regular system as many of the deaths occur at home
- * The HDSS system identifies causes of death using verbal Autopsy method

* Cause of death

*The objective of this analysis was to describe maternal and child death rate and causes of death in the six HDSS sites in Ethiopia during 2010-2015

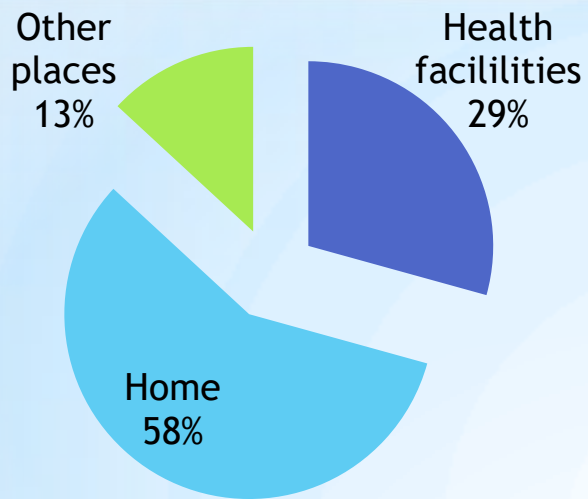
*Objective

- * Deaths registration
- * VA interview using WHO 2007 VA tool
- * Decoded by physician (2/3 physicians independently) using ICD-10
- * Data was entered into a database and analyzed using STATA

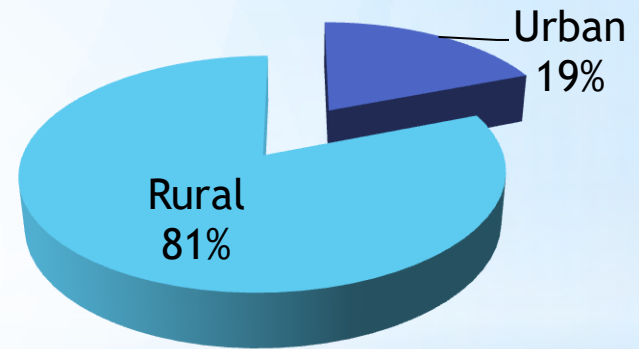
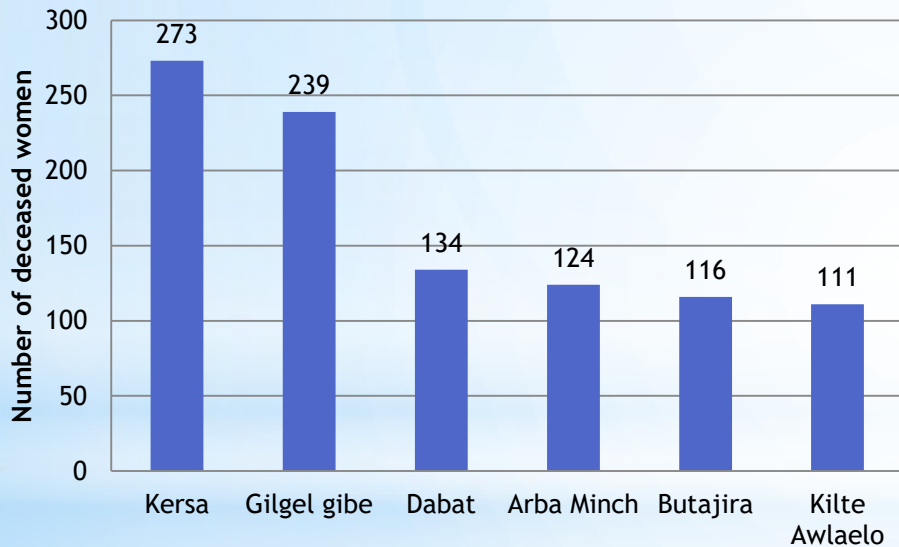
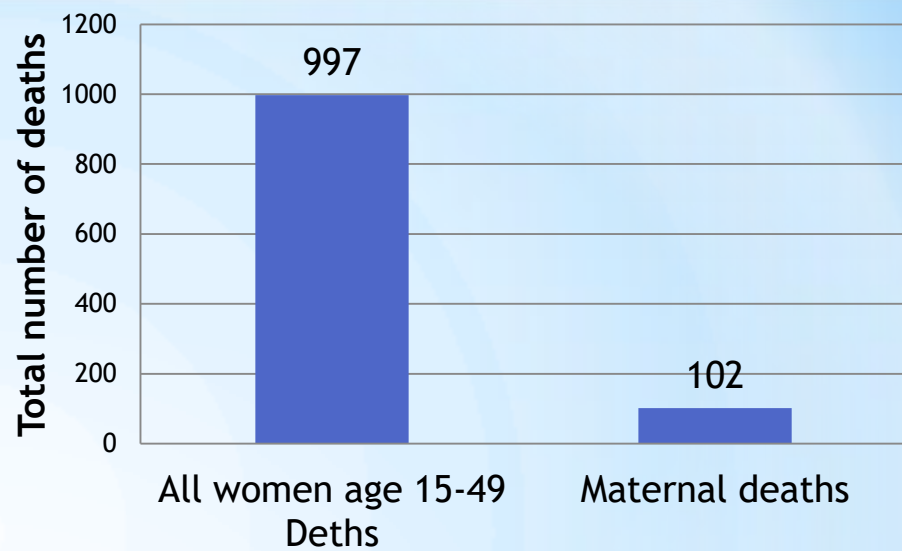
* Methodology-Verbal Autopsy

Year	Population	Women 15-49	Births
2010	350,677	82,178	9,711
2011	359,655	85,634	8,957
2012	364,103	87,667	9,146
2013	370,412	90,145	9,905
2014	380,752	93,832	9,848
2015	461,980	113,830	8,019
Total			55,586

*** Population and Births:
2010-2015**



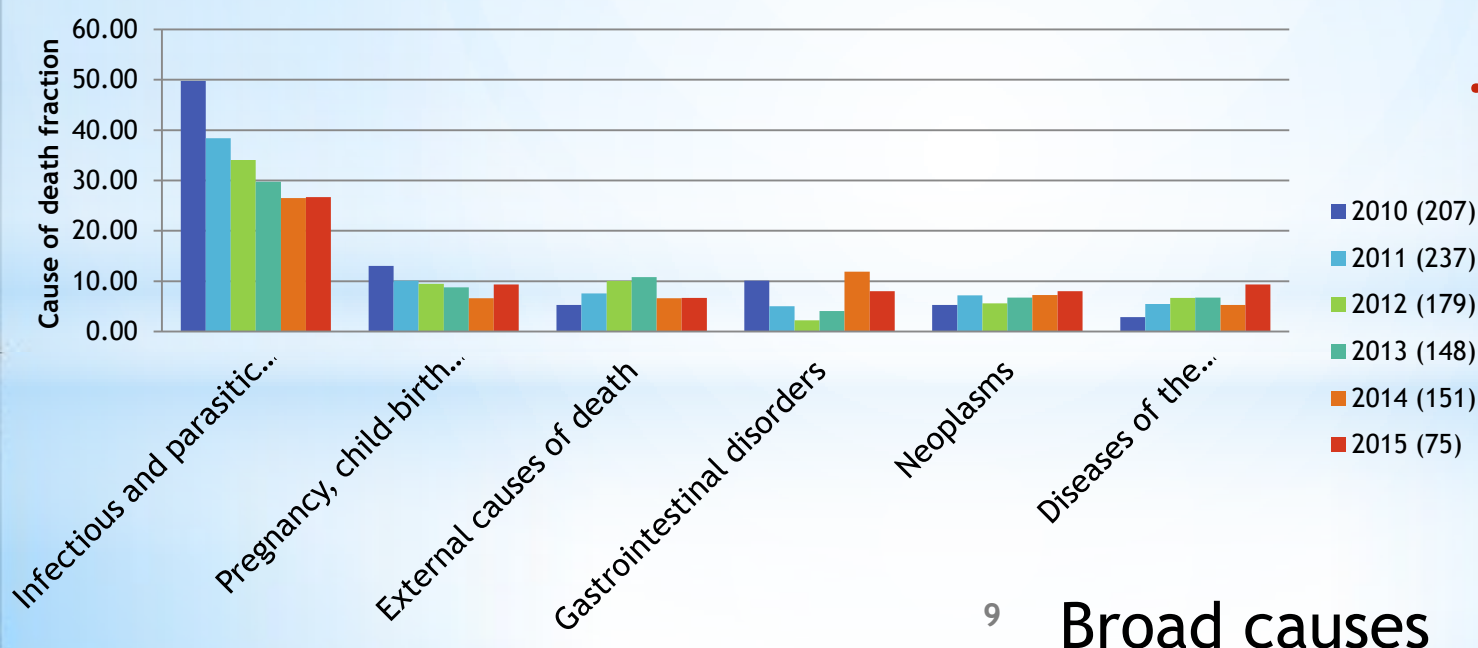
Maternal Death Places



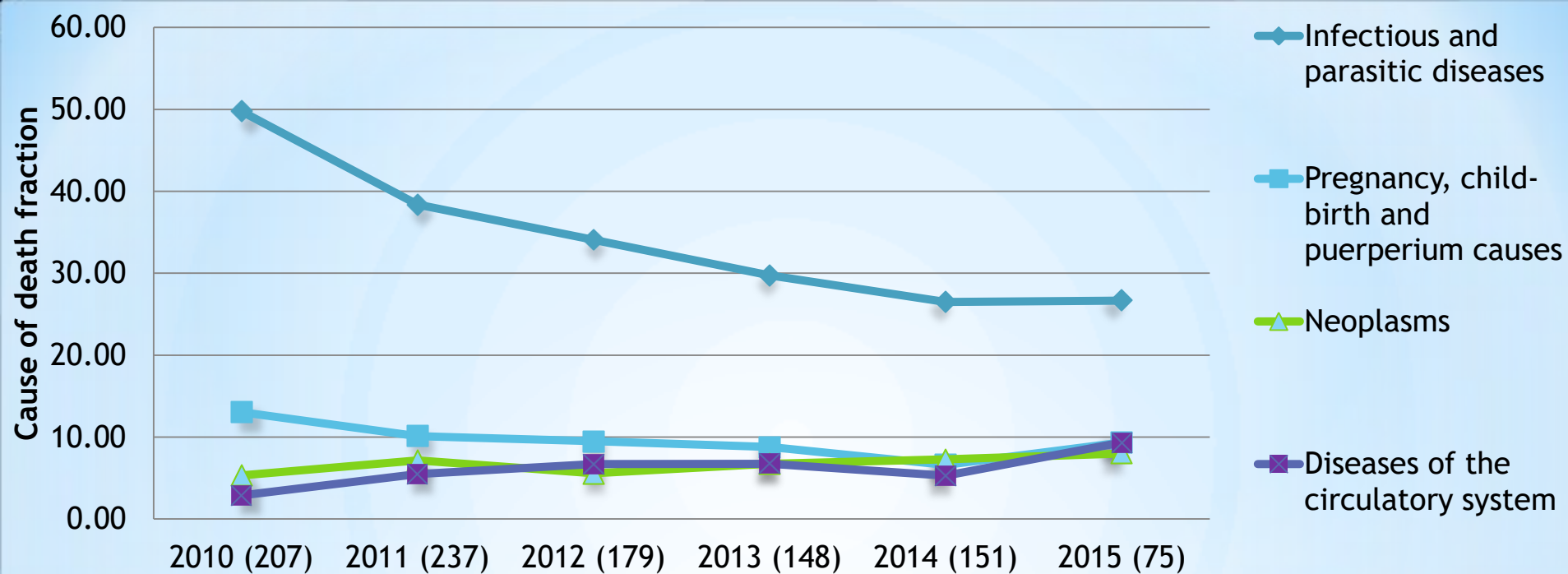
Residence deceased women

* Death of W 15-49

Broad causes of death of women 15-49	2010 (207)	2011 (237)	2012 (179)	2013 (148)	2014 (151)	2015 (75)	Total (997)
Infectious and parasitic diseases	49.76	38.40	34.08	29.73	26.49	26.67	36.01
Pregnancy, child-birth and puerperium causes	13.04	10.13	9.50	8.78	6.62	9.33	9.83
External causes of death	5.31	7.59	10.06	10.81	6.62	6.67	7.82
Gastrointestinal disorders	10.14	5.06	2.23	4.05	11.92	8.00	6.72
Neoplasms	5.31	7.17	5.59	6.76	7.28	8.00	6.52
Diseases of the circulatory system	2.90	5.49	6.70	6.76	5.30	9.33	5.62
Mental and nervous system disorders	0.97	5.91	2.79	4.05	4.64	2.67	3.61
Renal disorders	2.42	1.69	2.79	1.35	5.96	5.33	2.91
Nutritional and endocrine disorders	0.00	1.27	2.23	4.05	2.65	2.67	1.91
Respiratory disorders	0.00	0.42	0.56	0.68	1.32	1.33	0.60
Perinatal causes of death	0.00	0.00	0.56	0.00	0.00	0.00	0.10
Undetermined	7.25	11.39	13.41	15.54	10.60	13.33	11.53
Unspecified causes of death	2.90	5.49	9.50	7.43	10.60	6.67	6.82



* Women
15-49
Years
of Age

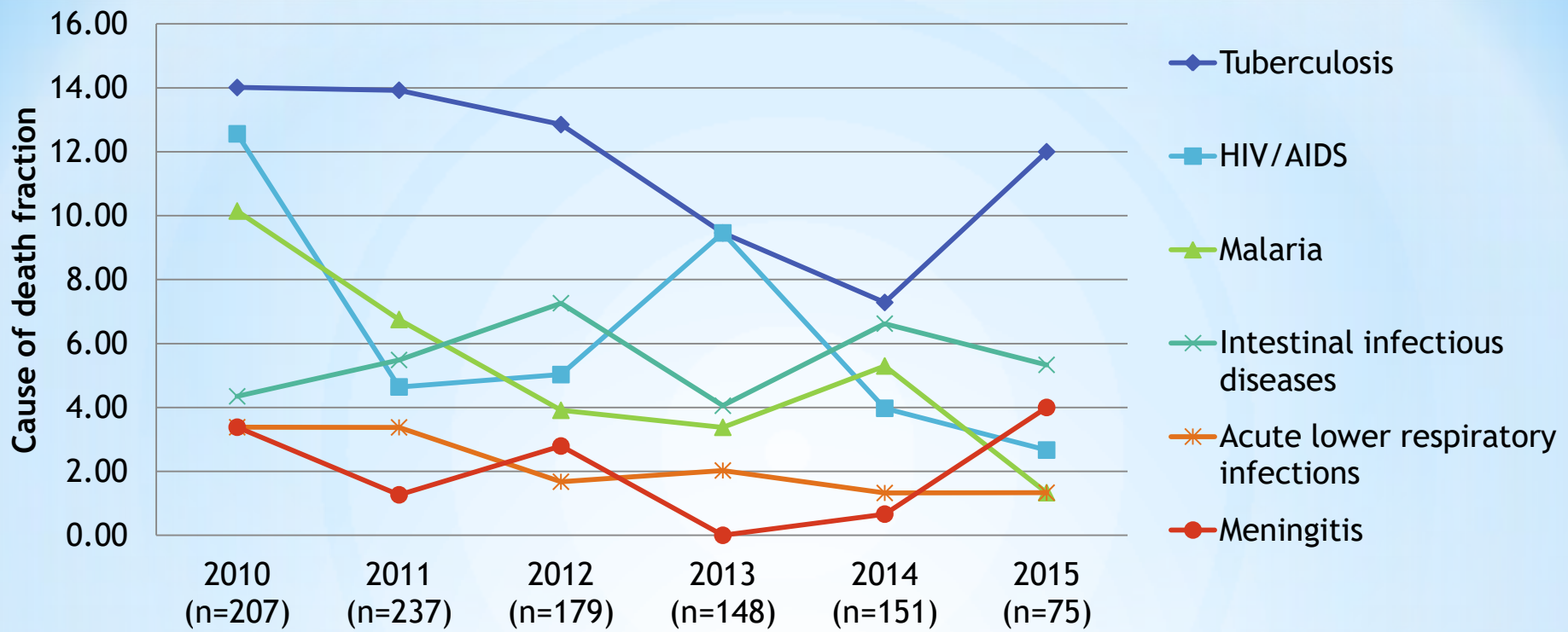


- * Fast decreasing pattern: Infectious and parasitic diseases
- * Slow decreasing pattern: Pregnancy, child-birth and puerperium causes
- * Increasing pattern: Neoplasm and diseases of the circulatory system

* Pattern of major broad causes of death for women age 15-49

Specific causes of death of women 15-49	2010 (n=207)	2011 (n=237)	2012 (n=179)	2013 (n=148)	2014 (n=151)	2015 (n=75)	Total (n=997)
Tuberculosis	14.01	13.92	12.85	9.46	7.28	12.00	11.94
HIV/AIDS	12.56	4.64	5.03	9.46	3.97	2.67	6.82
Malaria	10.14	6.75	3.91	3.38	5.30	1.33	5.82
Intestinal infectious diseases	4.35	5.49	7.26	4.05	6.62	5.33	5.52
Postpartum hemorrhage	5.31	3.80	4.47	6.76	2.65	2.67	4.41
Chronic liver disease	5.31	0.84	2.23	2.70	9.27	6.67	4.01
Congestive heart failure	0.48	3.38	3.35	4.73	2.65	2.67	2.81
Renal failure	1.93	1.69	2.79	1.35	5.96	5.33	2.81
Epilepsy	0.97	5.49	2.79	0.68	1.99	1.33	2.51
Acute lower respiratory infections	3.38	3.38	1.68	2.03	1.32	1.33	2.41
Malignant neoplasm of breast	2.42	2.53	2.23	1.35	3.31	2.67	2.41
Gastric and duodenal ulcer	3.38	3.38	0.00	1.35	1.99	1.33	2.11
Meningitis	3.38	1.27	2.79	0.00	0.66	4.00	1.91
Assault	0.97	1.69	1.68	2.70	1.99	0.00	1.60
Intentional self-harm	0.48	0.84	2.23	4.05	1.32	1.33	1.60
Puerperal sepsis	2.90	1.69	1.12	0.68	1.32	0.00	1.50
Hypertensive disorders of pregnancy	0.48	1.69	0.00	0.00	1.32	6.67	1.20
Malignant neoplasm of cervix	0.97	2.11	0.00	1.35	1.99	0.00	1.20
Diabetes mellitus	0.00	0.42	1.12	2.70	1.99	0.00	1.00
Accidental drowning and submersion	0.00	0.84	2.23	0.68	0.00	2.67	0.90

***Top 20 specific causes of death of Women 15-49**

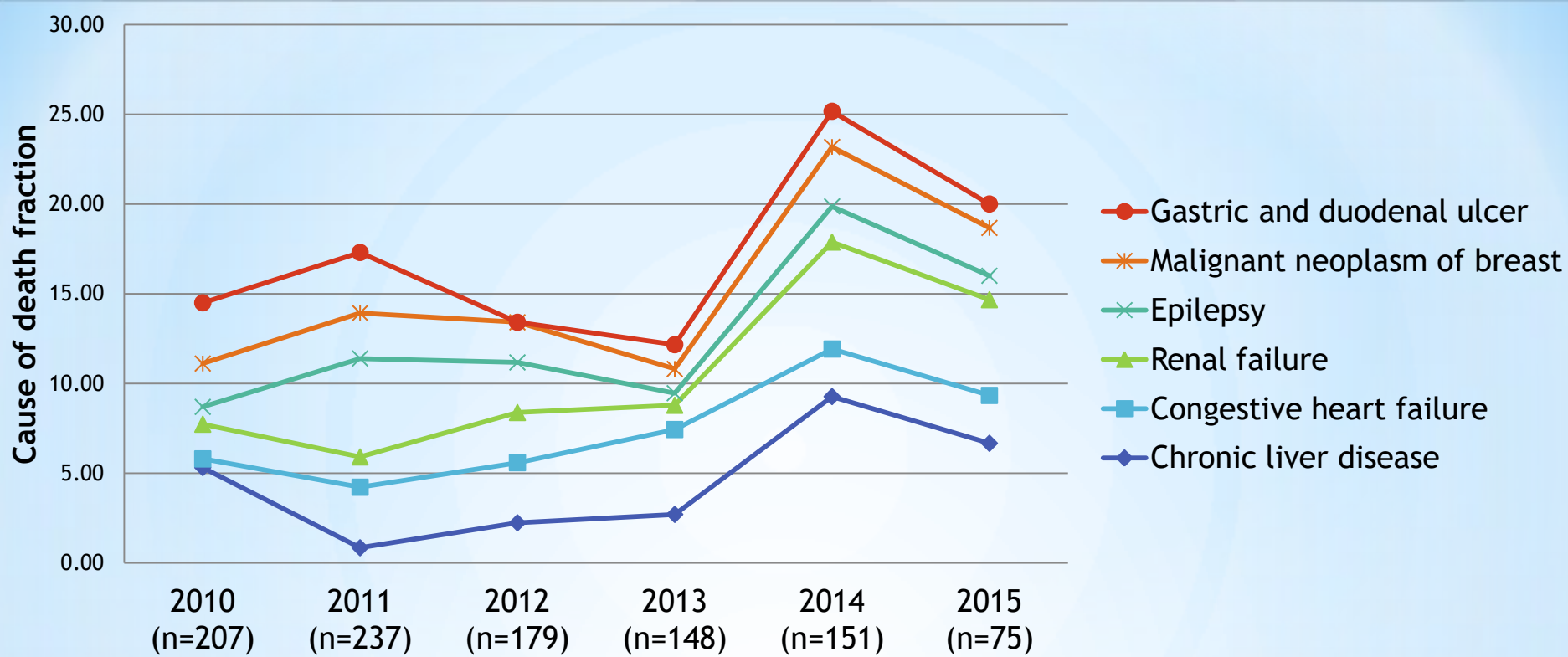


* Fast decreasing pattern: HIV/AIDS, Malaria

* Same Pattern: Intestinal Infectious diseases, ALRI, Meningitis

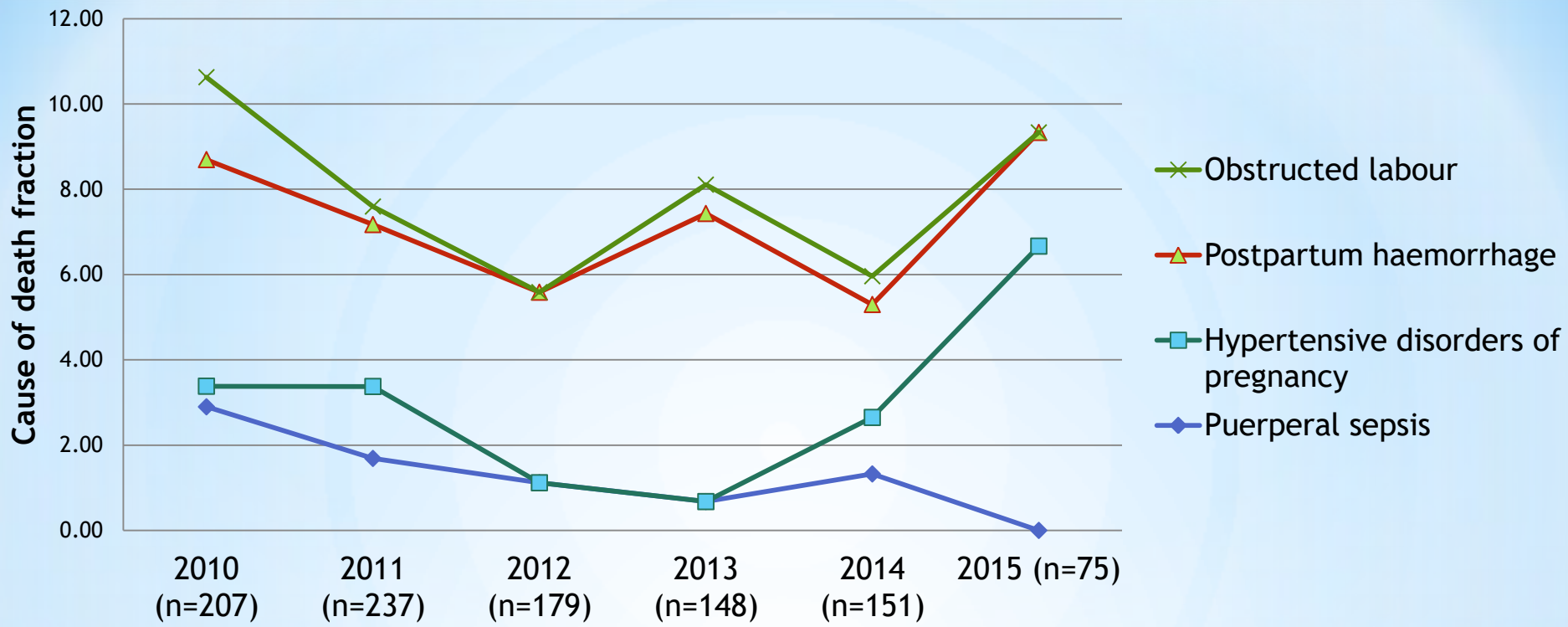
* Unstable pattern: Tuberculosis

*** Infectious diseases as a cause of death: W15-49**



* All the leading causes of death are increasing year to year

* **Leading chronic diseases as a cause of death: W15-49**

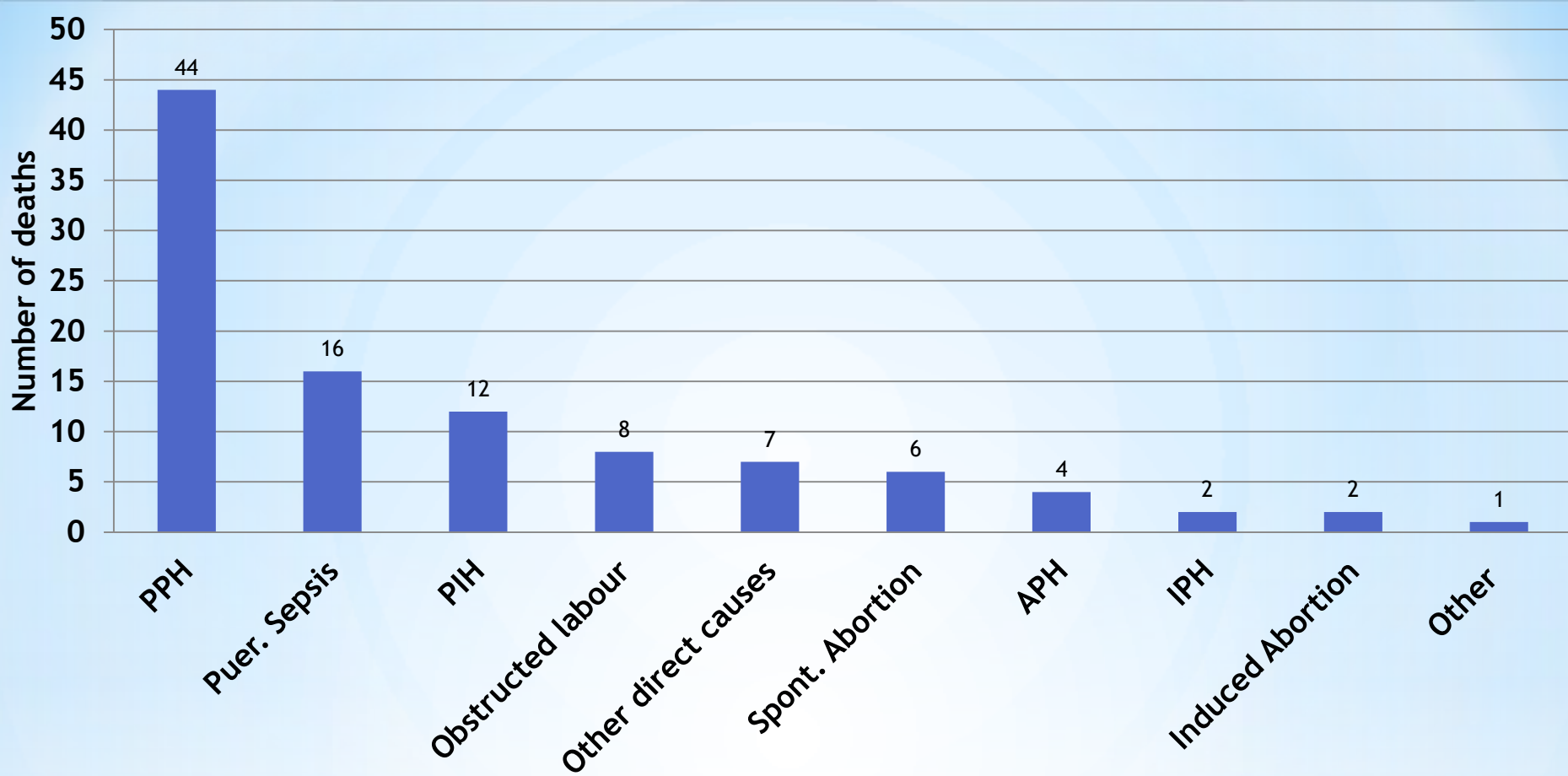


- * Increasing pattern: Hypertensive disorder of Pregnancy
- * Unstable pattern: Obstructed labor, PPH
- * Decreasing pattern: Puerperal sepsis

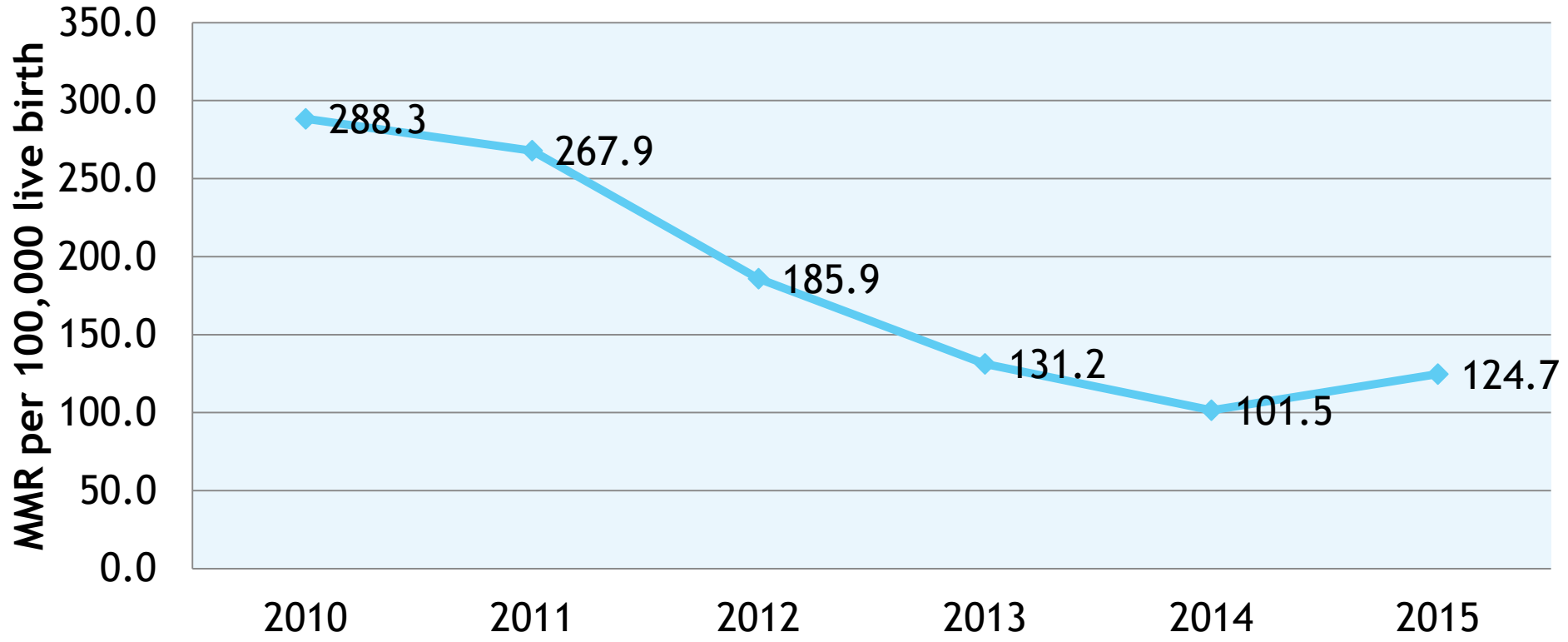
* Leading maternal causes of death: W15-49



* Maternal Deaths



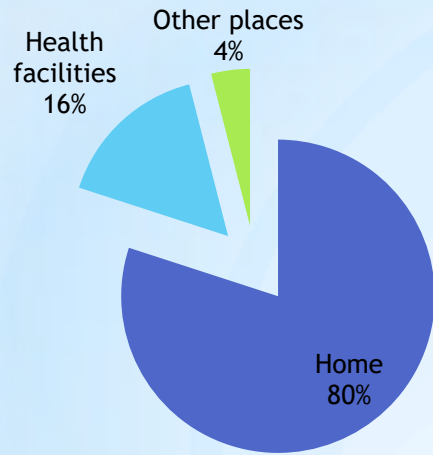
* Maternal causes of death:
W15-49



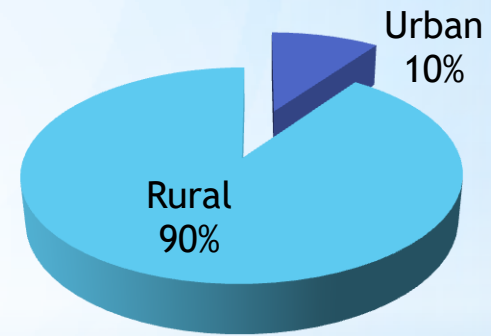
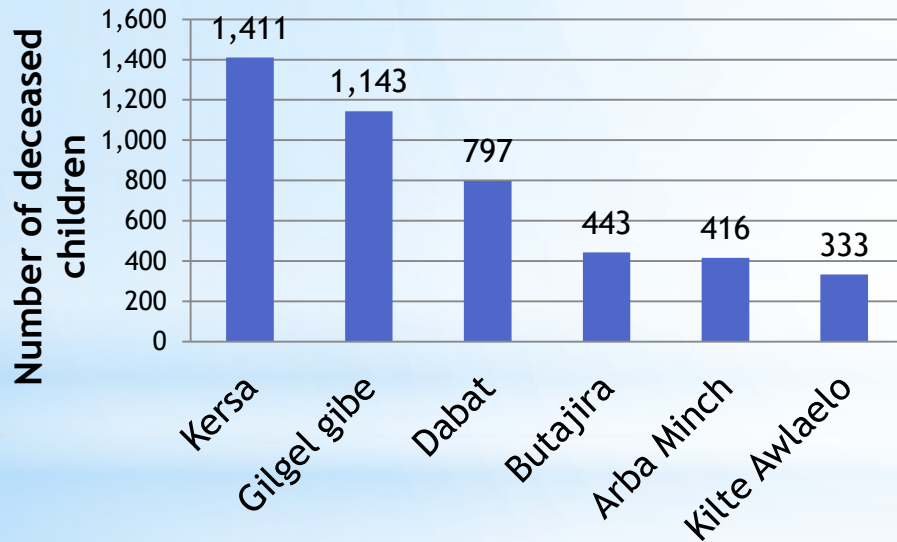
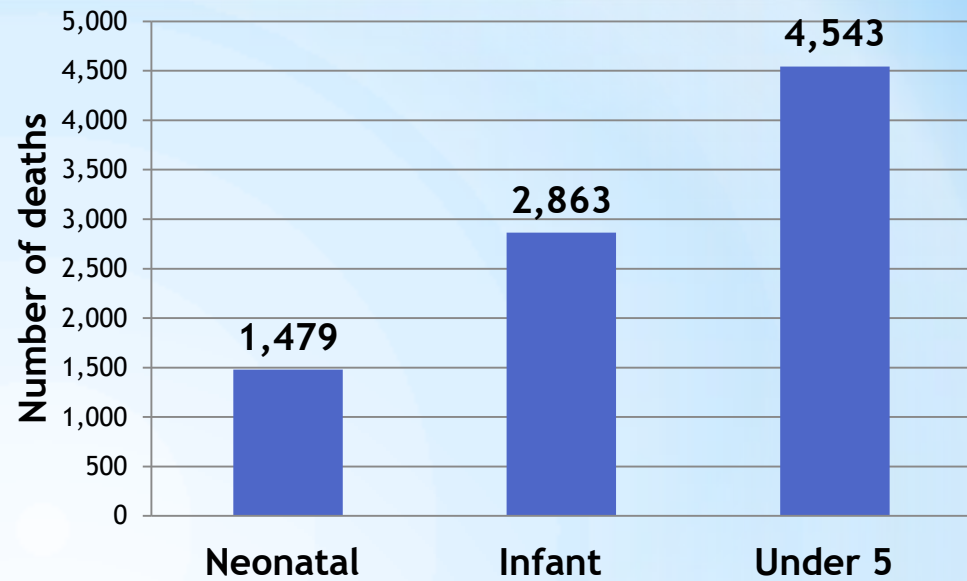
Maternal Deaths	28	24	17	13	10	10
Births	9,711	8,957	9,146	9,905	9,848	8,019

Maternal Deaths	102
Births	55,586
Over all MMR	183.5

* Maternal Mortality Rate

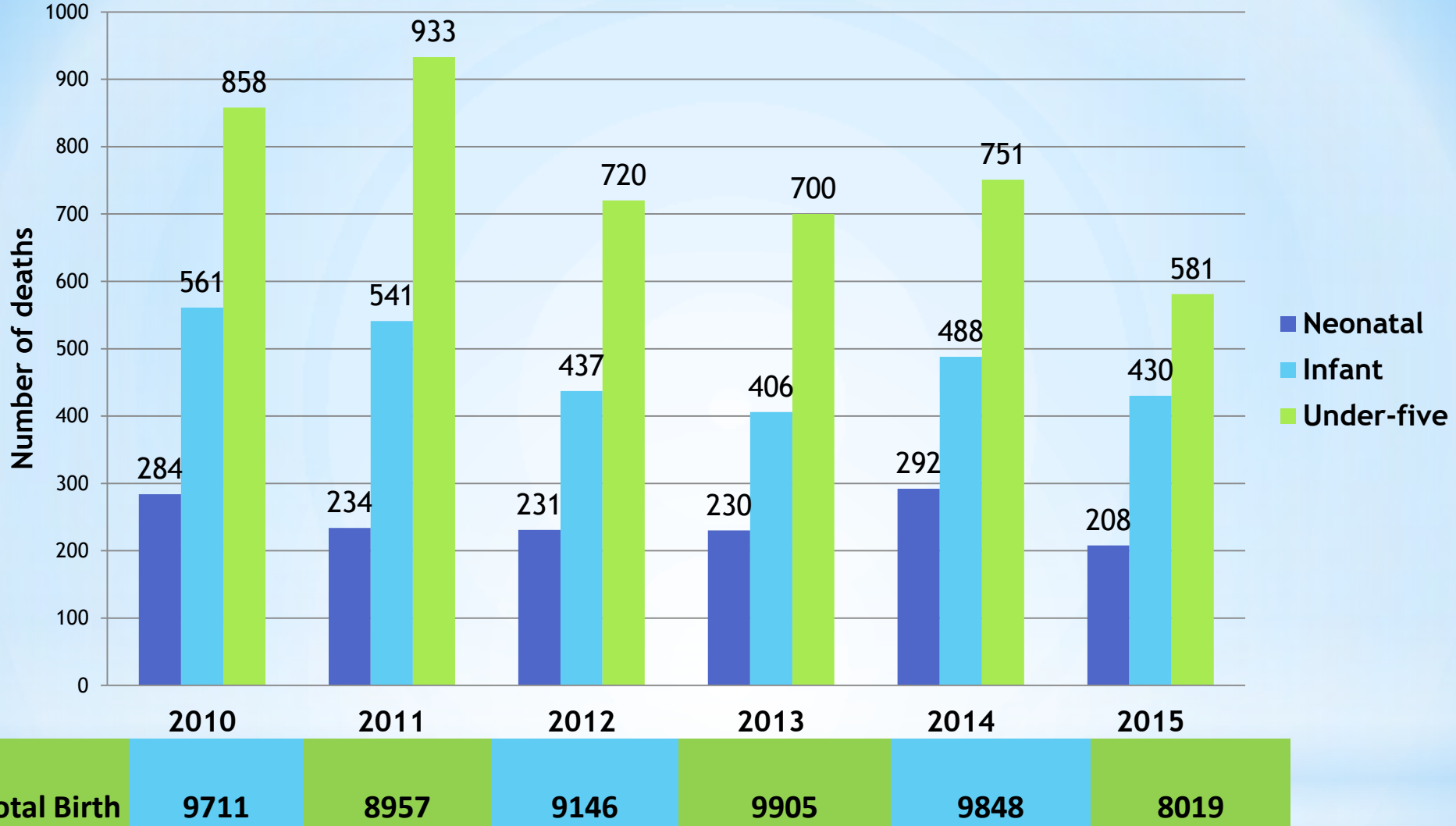


Under five age children places of death



Residence of deceased children

* Death: Children Under 5



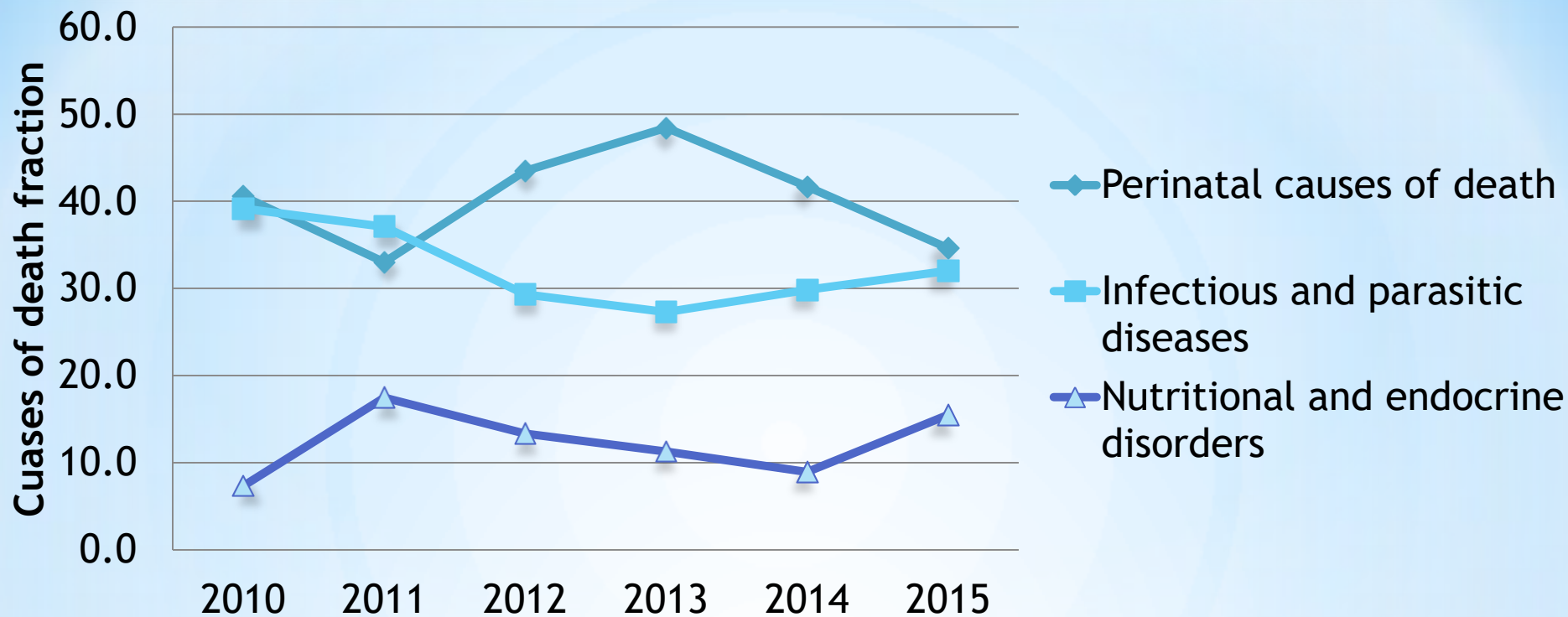
*** Births & Deaths: U5, Infant, Neonates**



* Child Mortality

	2010 (n=853)	2011 (n=933)	2012 (n=720)	2013 (n=700)	2014 (n=751)	2015 (n=581)	Total (n=4543)
Broad causes of death							
Perinatal causes of death	40.6	33.0	43.5	48.4	41.7	34.6	40.1
Infectious and parasitic diseases	39.2	37.1	29.3	27.3	29.8	32.0	32.9
Nutritional and endocrine disorders	7.3	17.5	13.3	11.3	8.9	15.5	12.3
External causes of death	2.8	2.5	2.4	3.0	4.8	3.6	3.1
Diseases of the circulatory system	0.2	0.3	0.1	0.4	1.6	1.5	0.7
Gastrointestinal disorders	0.6	0.4	0.3	0.6	1.3	0.7	0.6
Mental and nervous system disorders	0.1	0.3	0.4	0.6	0.3	1.0	0.4
Respiratory disorders	0.7	0.1	0.8	0.3	0.3	0.3	0.4
Neoplasms	0.1	0.1	0.0	0.4	0.5	0.9	0.3
Renal disorders	0.3	0.0	0.4	0.0	0.5	0.7	0.3

* Broad causes of death of Children U5



- * Decreasing but high ceiling: Perinatal causes / Infectious and parasitic diseases
- * Steadily increasing: Nutritional and endocrine disorder

* **Pattern of the leading broad causes of death among Under 5**

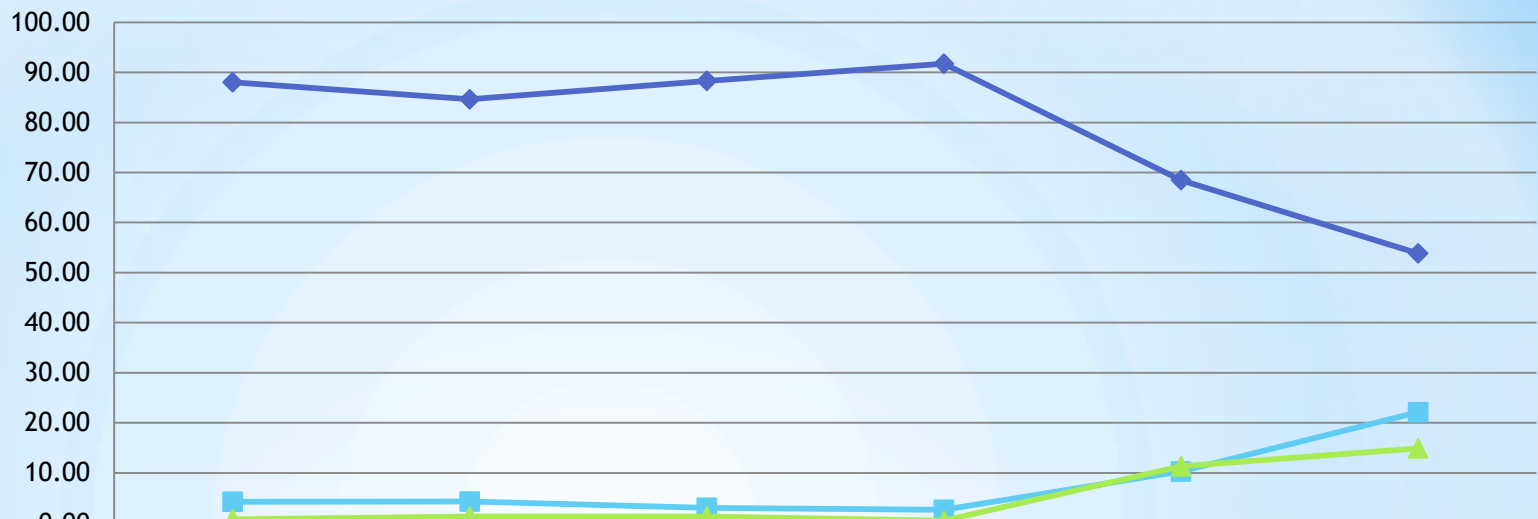
Specific causes	2010 (n=853)	2011 (n=933)	2012 (n=720)	2013 (n=700)	2014 (n=751)	2015 (n=581)	Total (n=4543)
Bacterial sepsis of newborn	11.66	12.11	14.58	12.71	11.32	8.09	11.86
Severe malnutrition	6.41	15.76	11.94	10.86	8.66	15.32	11.40
ALRI	16.32	13.50	10.14	8.57	8.92	6.37	11.07
IID	8.97	12.97	9.86	9.43	11.98	11.36	10.81
Birth asphyxia (PRD)	10.14	7.07	10.00	10.14	8.12	6.37	8.67
Prematurity (Inc. Res. Dist)	6.64	3.75	4.31	6.14	6.79	4.82	5.39
Malaria	5.71	3.64	0.97	3.00	1.07	2.58	2.95
Meningitis	2.21	2.14	2.36	2.43	2.13	3.10	2.36
Tuberculosis	2.80	1.93	2.92	1.00	2.00	3.79	2.36
Measles	1.52	1.50	1.81	1.00	2.66	3.61	1.94
Accidental drowning	0.82	0.64	0.97	1.00	1.20	1.20	0.95

 **Specific leading causes of death of Children U5**



* Neonatal causes of death

Causes
death fraction




	2010	2011	2012	2013	2014	2015
◆ Perinatal causes	88.03	84.62	88.31	91.74	68.49	53.85
■ Infectious/parasitic	4.23	4.27	3.03	2.61	10.27	22.12
▲ Other causes	0.70	1.28	1.30	0.43	11.30	14.90

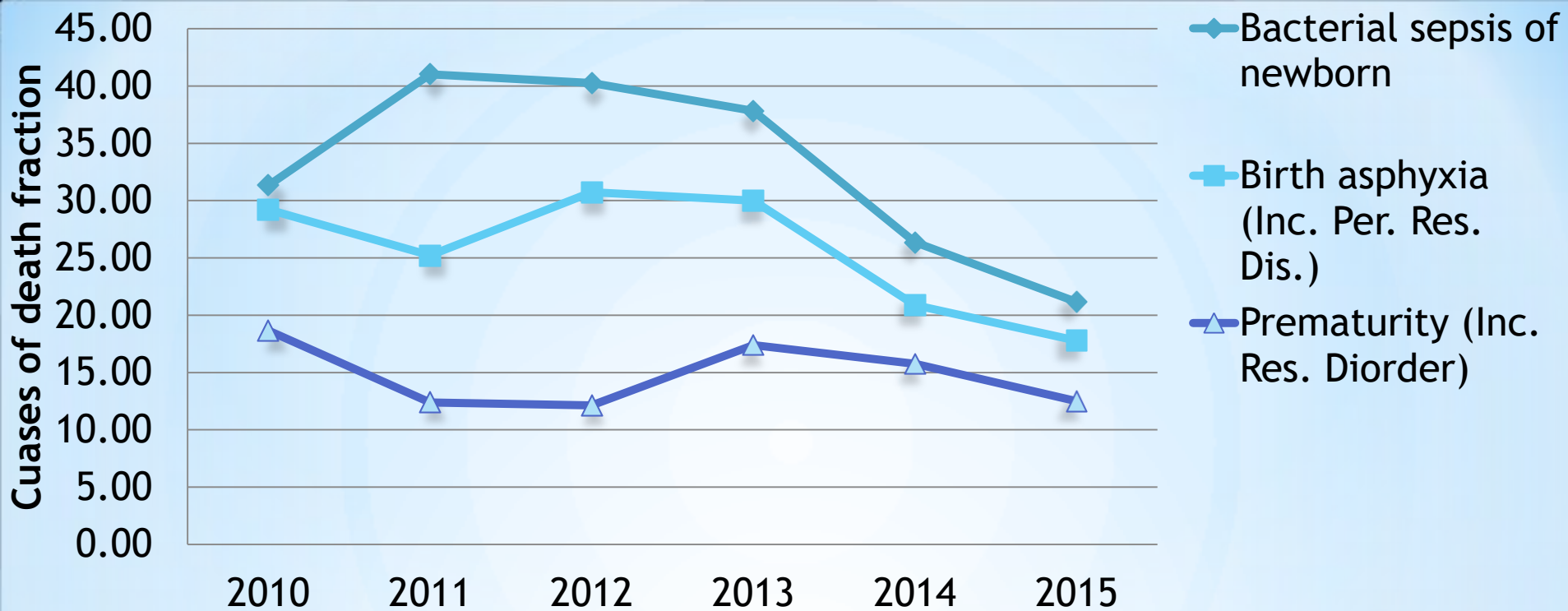
* Decreasing pattern: Perinatal causes of death

* Increasing pattern: Infectious and other causes neonatal death

* Broad Neonatal causes of death

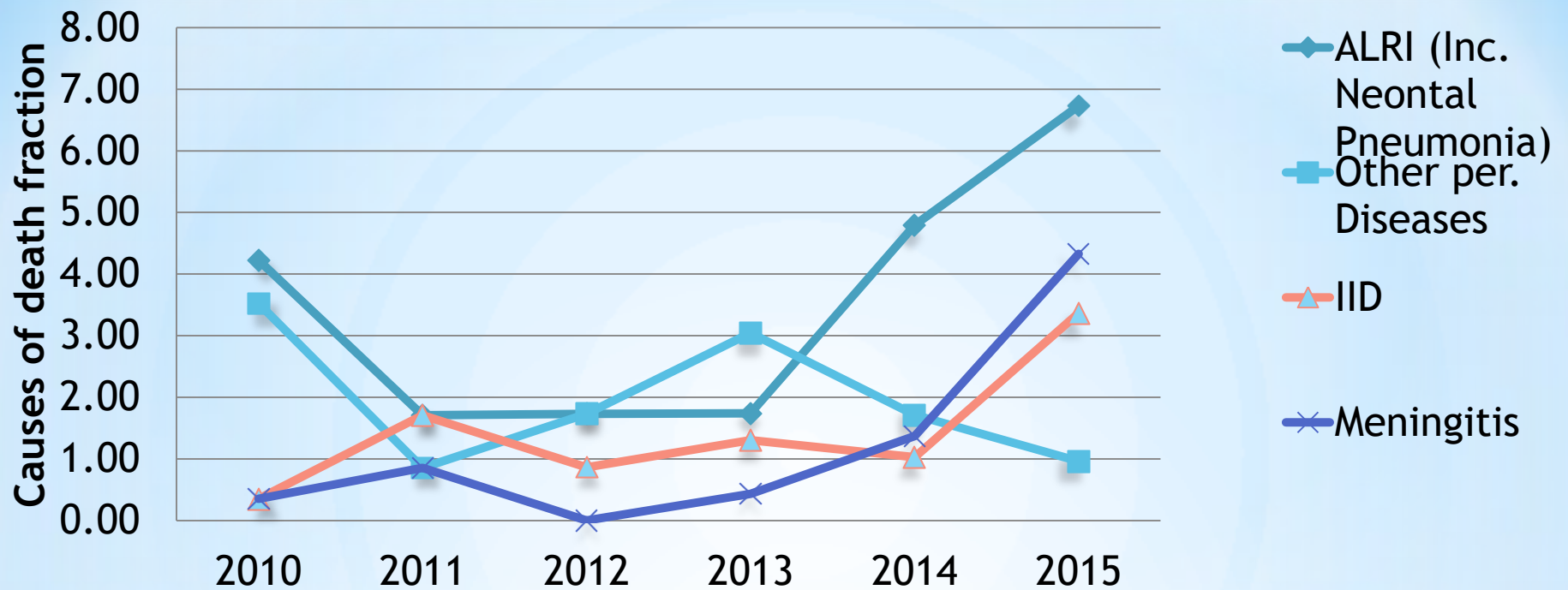
Specific Causes of death	2010 (n=284)	2011 (n=234)	2012 (n=231)	2013 (n=230)	2014 (n=292)	2015 (n=208)	Total (n=1479)
Bacterial sepsis of newborn	31.34	41.03	40.26	37.83	26.37	21.15	32.86
Birth asphyxia (Inc. Per. Res. Dis.)	29.23	25.21	30.74	30.00	20.89	17.79	25.69
Prematurity (Inc. Res. Disorder)	18.66	12.39	12.12	17.39	15.75	12.50	15.01
ALRI	4.23	1.71	1.73	1.74	4.79	6.73	3.52
Other per. Diseases	3.52	0.85	1.73	3.04	1.71	0.96	2.03
IID	0.35	1.71	0.87	1.30	1.03	3.37	1.35
Meningitis	0.35	0.85	0.00	0.43	1.37	4.33	1.15
Congenital malformation	0.70	0.85	1.73	0.00	1.03	1.44	0.95
Birth trauma	1.76	0.85	0.43	0.43	1.03	0.00	0.81
Malaria	0.70	0.00	0.00	0.00	0.68	2.40	0.61

 **10 leading specific causes of Neonatal death**



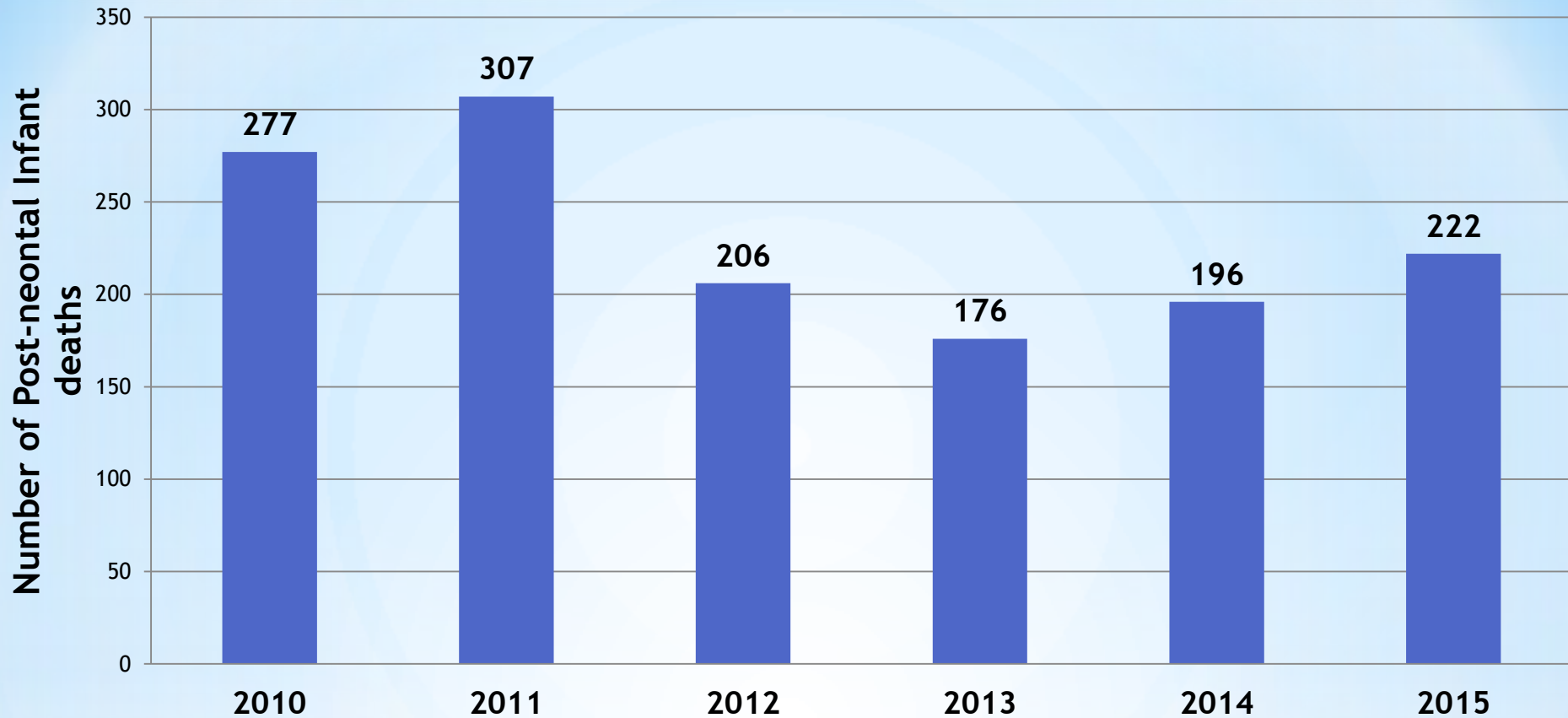
* Decreasing pattern: Bacterial sepsis of the newborn, Birth asphyxia, Prematurity

* **Pattern of the top three leading causes of Neonatal death**



- * Decreasing pattern: Other Perinatal conditions
- * Increasing/sustaining pattern: ALRI, IID, Meningitis

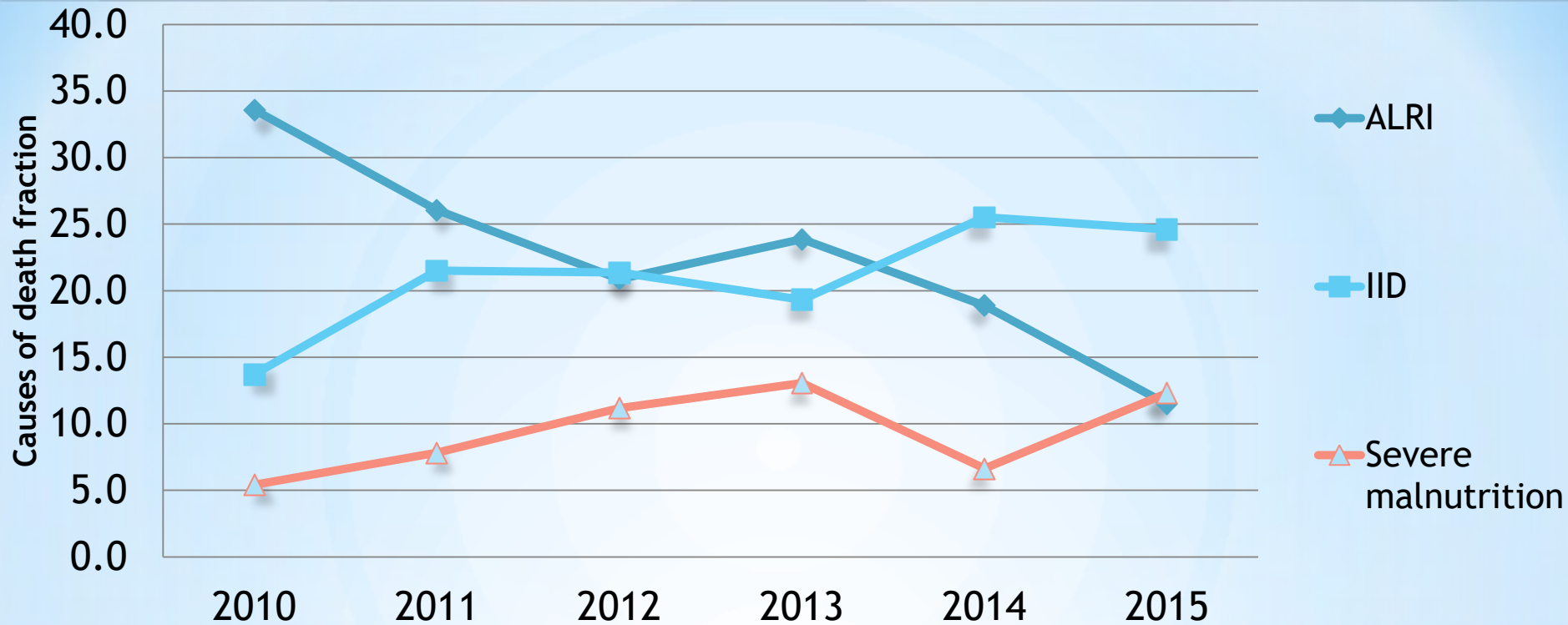
* **Pattern of second leading causes of Neonatal death**



* **Post-Neonatal Infant causes
of death**

Leading specific causes	2010 (n=277)	2011 (n=307)	2012 (n=206)	2013 (n=176)	2014 (n=196)	2015 (n=222)	Total (n=1284)
ALRI	33.57	26.06	20.87	23.86	18.88	11.48	24.07
IID	13.72	21.50	21.36	19.32	25.51	24.59	20.40
Severe malnutrition	5.42	7.82	11.17	13.07	6.63	12.30	8.80
Malaria	11.55	6.19	0.00	6.25	1.53	1.64	5.22
Tuberculosis	5.05	3.58	6.80	1.14	2.04	5.74	4.05
Bacterial sepsis	3.61	5.21	5.83	0.57	4.08	2.46	3.89
Meningitis	2.53	1.95	3.88	4.55	3.57	1.64	2.96
Measles	1.81	1.95	1.94	0.00	4.08	6.56	2.41
Infectious diseases, unspecified	1.08	0.33	1.46	2.84	1.02	2.46	1.32
Nutritional anemia	1.08	1.63	0.97	0.57	0.51	0.82	1.01

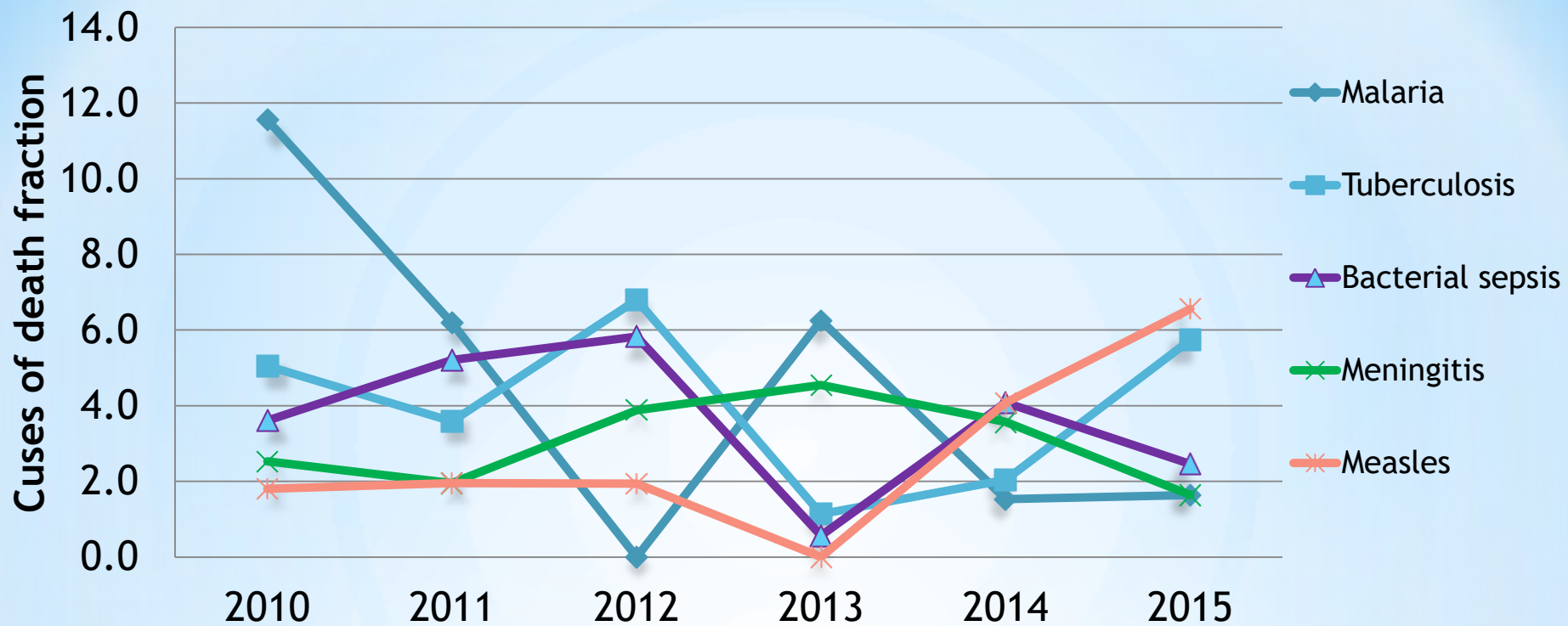
*** Top 10 specific causes of Post-Neonatal Infant deaths**



* Decreasing pattern: ALRI (Including Pneumonia)

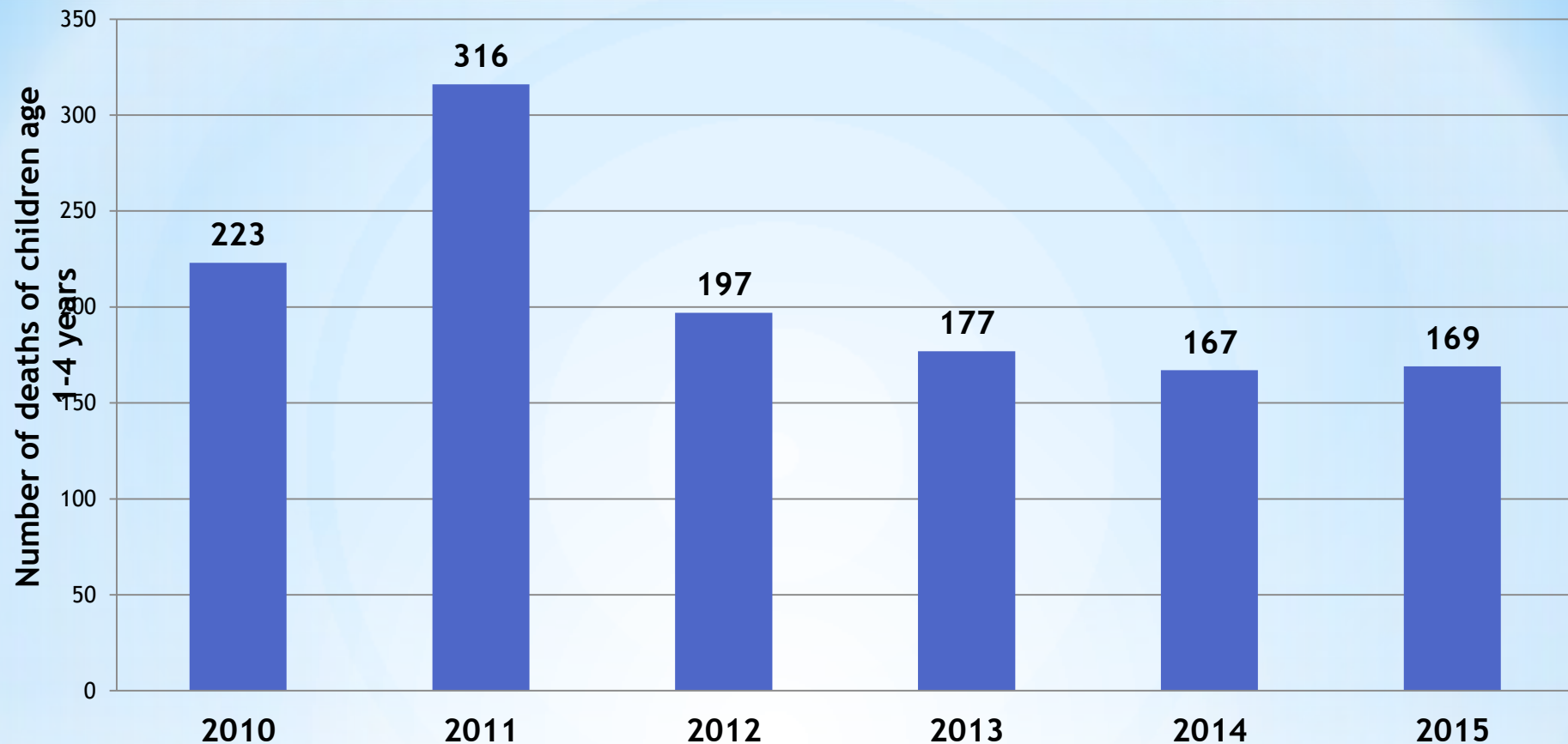
* Increasing pattern: IID (Including diarrhea, and Sever malnutrition)

* **Pattern of top 3 leading cause of Post-neonatal Infant deaths**



- * Decreasing pattern: ALRI (Including Pneumonia)
- * Increasing pattern: Measles, Tuberculosis
- * Unstable Pattern: Malaria

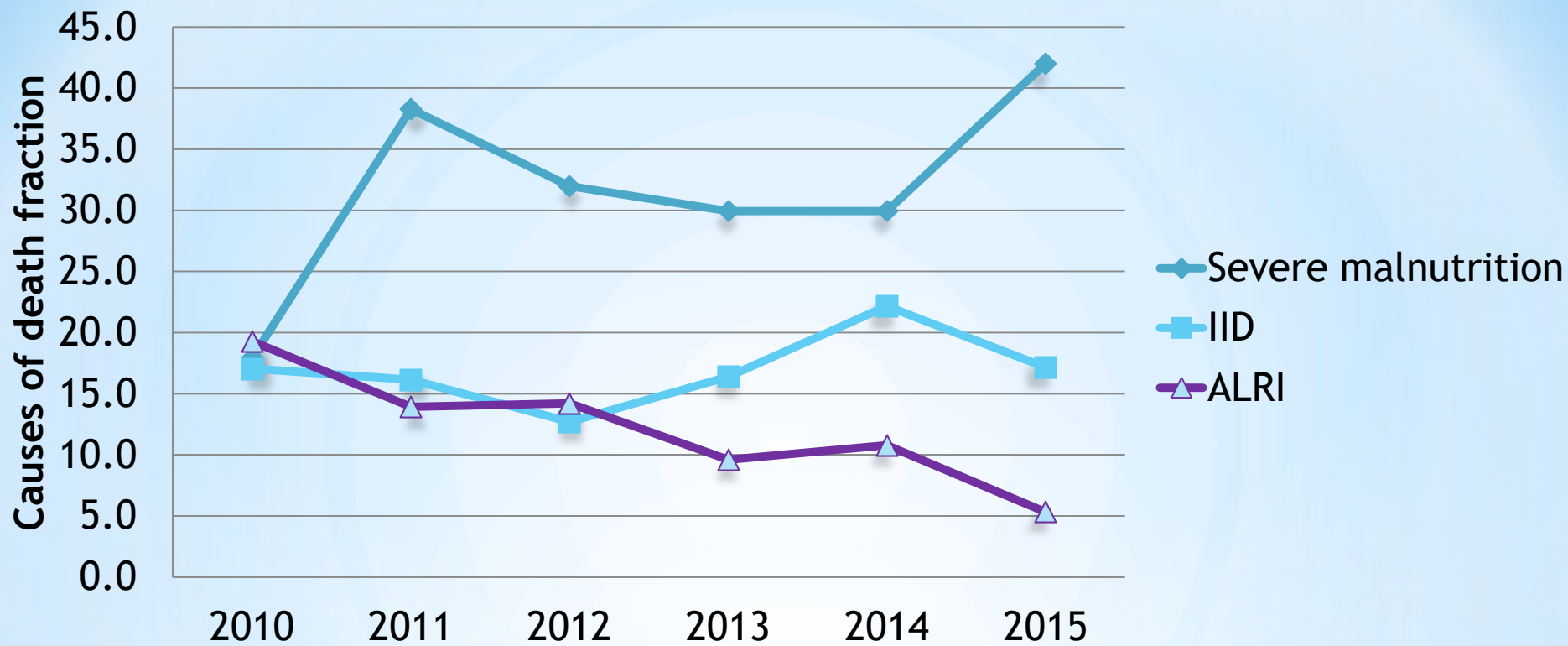
* Pattern of other leading cause of Post-neonatal Infant deaths



* Causes of death of children
age 1-4 years

Specific causes of death	2010 (n=223)	2011 (n=316)	2012 (n=197)	2013 (n=177)	2014 (n=167)	2015 (n=169)	Total (n=1249)
Severe malnutrition	17.94	38.29	31.98	29.94	29.94	42.01	31.87
IID	17.04	16.14	12.69	16.38	22.16	17.16	16.73
ALRI	19.28	13.92	14.21	9.60	10.78	5.33	12.73
Malaria	6.73	4.75	3.55	5.65	1.80	4.73	4.64
Measles	3.14	2.53	3.55	3.95	7.19	7.69	4.32
Meningitis	4.93	3.80	4.57	4.52	2.99	4.14	4.16
Tuberculosis	3.59	2.22	3.05	2.26	2.40	3.55	2.80
Drowning and submersion	1.79	1.27	2.03	3.39	4.19	1.78	2.24
Nutritional anaemia	2.24	3.48	4.06	1.13	0.00	0.00	2.08
Infectious diseases, unspecified	1.79	1.27	1.02	1.69	0.00	0.00	1.04

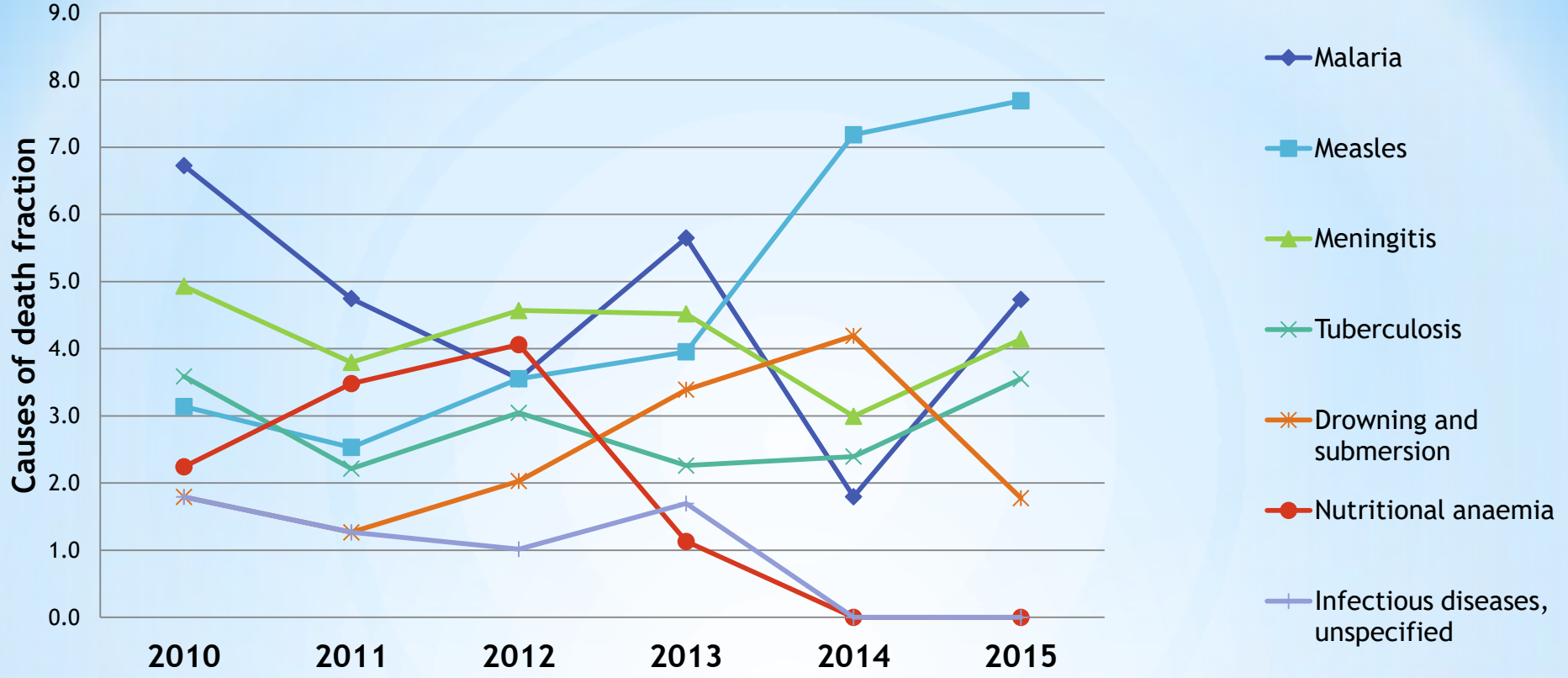
*** 10 top specific causes of death of children age 1-4 years**



* Decreasing pattern: IID, ALRI

* Increasing pattern: Sever malnutrition

* **Pattern of top 3 leading cause of death of Children age 1-4 years**



- * Decreasing pattern: Malaria, Nutritional anaemia, unspecified infectious diseases
- * Increasing pattern: Measles, Tuberculosis
- * Unstable pattern: Drowning and submersion, Meningitis,

* Pattern of other leading cause of death of Children age 1-4 years

- * Tuberculosis is the single most important cause of death for women aged 15-49 followed by HIV/AIDS, malaria, and IID
- * Chronic conditions such as a cause of death for women of reproductive age is increasing from time to time Maternal mortality is decreasing; yet needs to be triangulated.

* Conclusion-1

- * Maternal mortality is decreasing over the six years period
- * The major specific causes of maternal mortality are:
 - * Post-partum hemorrhage and puerperal sepsis
- * Obstructed labor, post-partum hemorrhage and pregnancy hypertensive disorders as a cause of death are increasing over time

* Conclusion-2

- * NMR, IMR and U5MR shows no sign of reduction after the year 2013
- * Neonatal causes of death:
 - * Bacterial sepsis of the newborn, Birth asphyxia, Prematurity showed a decreasing pattern
 - * ALRI, IID and meningitis are showing an increasing pattern
- * Post-neonatal causes of death:
 - * IID (Including diarrhea) and Sever malnutrition showed an increasing pattern
- * Children age 1-4 years cause of death:
 - * Sever-malnutrition is the most important cause of death

* Conclusion-3

- *Tuberculosis: health teaching on hygienic practices should be emphasized
 - * Case detection should be intensified
 - * Identification of strain and drug resistance
- *Double burden of morbidity/Mortality
 - * Improving awareness of the community about non-communicable causes of death
 - * Chronic conditions: Healthy life style should be stressed

* Recommendation-1

- * Maternal health care in the rural part of the country should be emphasized: ANC, Iron tables, and institutional deliveries
- * Immunization, safe water supply and nutritional intervention should be the focus related to child health

* Recommendations-2

- * EPHA
- * CDC
- * Respective Universities
- * Field and office workers
- * Community in the HDSS sites

* Acknowledgments