Thematic Note – 25 March 2015

Ebola Outbreak in West Africa

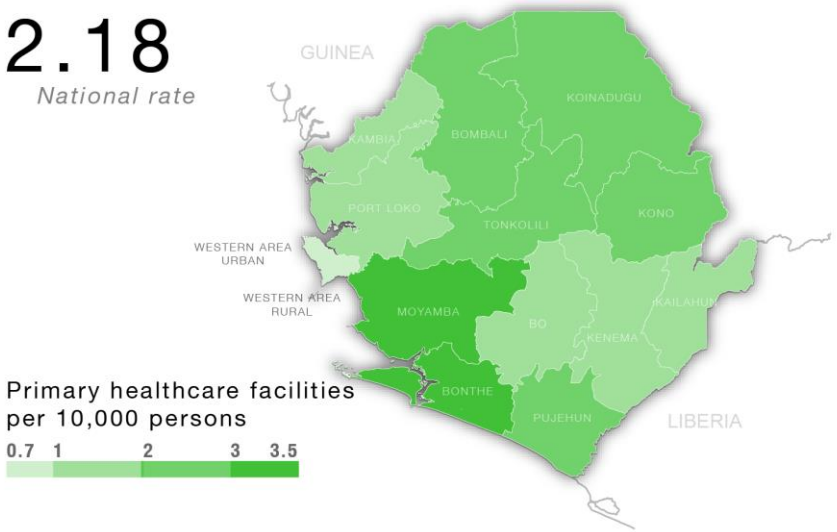
Impact on Health Service Utilisation in Sierra Leone

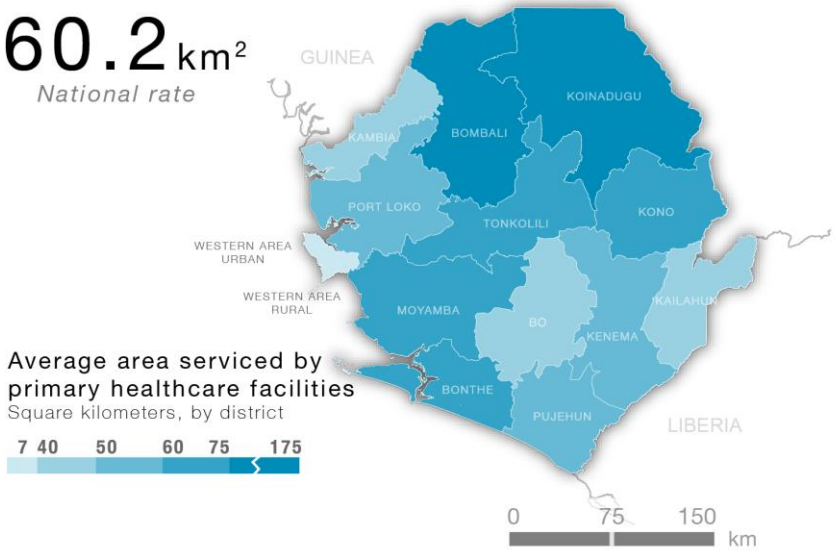
For an overview of the impact of the epidemic on health systems in Guinea, Liberia, and Sierra Leone, read the ACAPS **Briefing Paper on the Impact of Ebola on Health Systems**

Key Findings

- Overall, visits to primary health facilities decreased by a third in June–December 2014 compared to the same period in 2013. Most districts show an initial drop at the onset of the Ebola outbreak in June, and a further decline as the epidemic reached its peak in November–December.
- The decline in health service utilisation is not uniform across key health services. Malaria and diarrhoea services are the most affected. In December 2014 suspected malaria cases decreased by half compared to December 2013, and only 20% were receiving treatment. In the same period, treatment of diarrhoea decreased by about 60%.
- By December 2014 only half of all pregnant women were receiving antenatal care and delivering in primary health facilities.
- In September 2014 half of children under 12 months did not receive the recommended vaccinations, compared to about 70% coverage before the outbreak. Vaccination rates have remained low until the end of the year.
- Key health service utilisation has been most affected in Kenema, Port Loko, and Kailahun districts.

2014



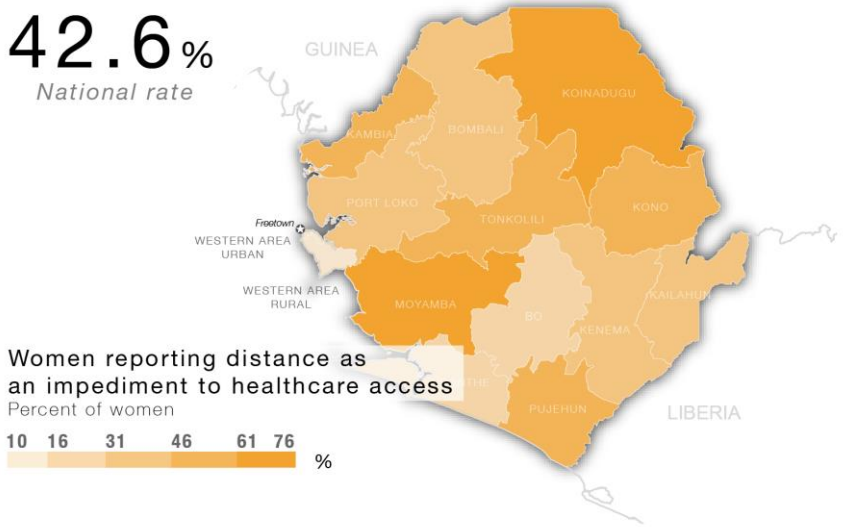


Sources UNMEER, Ministry of Health, DHS 2013

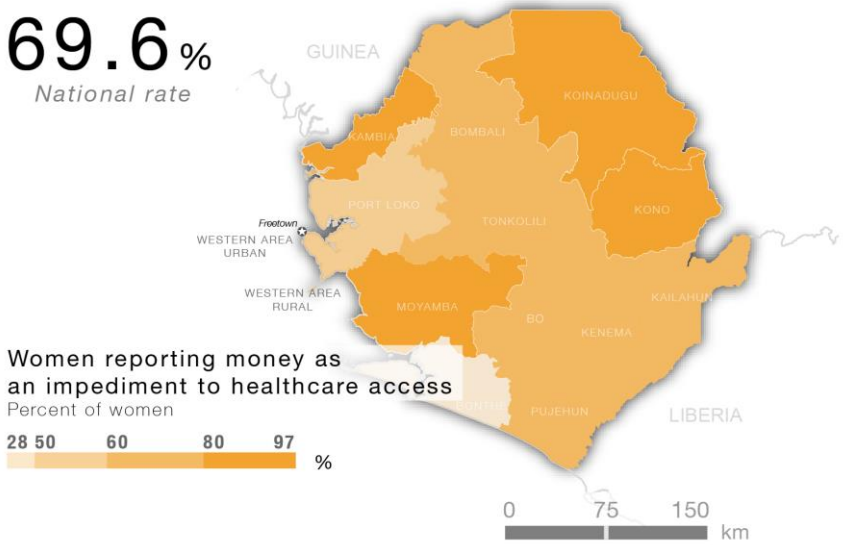
2013

acaps

42.6%
National rate



69.6%
National rate



Sources UNMEER, Ministry of Health, DHS 2013

Health Services in Sierra Leone

The analysis presented here focuses on the impact of Ebola on the utilisation of primary health services, as measured by number of visits to primary health units (PHUs) per 1,000 population. A general decrease in delivery of primary curative and preventative health services indicates an increased burden of morbidity and preventable deaths.

PHUs, including community health centres, community health posts, and maternal and child health posts, make up more than 80% of Sierra Leone's public health system. A total of 1,184 PHUs are registered by the Ministry of Health and Sanitation (MoHS). Secondary health facilities include district hospitals, most of which are located in the urban Western Area. Tertiary care is provided in hospitals in regional headquarter towns and in two national hospitals in Freetown (SLDHS, 2013).

Alongside the public health system, the private sector and faith-based organisation operate health facilities. 35 hospitals are registered in the country in total, including government, private, and missionary hospitals. Self-medication and reliance on traditional medicine are common, especially among the urban poor and most rural households (Jambai and MacCormack, 06/1996). A UNDP household survey showed that prior to the Ebola outbreak, 15% respondents sought healthcare from government hospitals, 4% relied on self-medication, and 1.1% sought diagnosis and treatment from traditional medicine before the Ebola outbreak. About 75% visited PHUs for healthcare (UNDP, 01/2015).

The health system is chronically underfinanced and understaffed. In 2006, Sierra Leone had 0.2 physicians per 10,000 people, compared to an average of 2 per 10,000 in Africa and 32 in Europe. The number of nurses and midwives was 2 per 10,000 between 2002 and 2008, compared to an average of 11 and 79 per 10,000, in Africa and Europe respectively (WHO, 2010; 2009). The situation has since worsened: as of 18 March, a reported 302 health workers were infected with Ebola and 221 had died, out of the total of about 1100 health workers in Sierra Leone (WHO, 18/03/2015). A health workforce of 23 per 10,000 population is required to achieve 80% coverage of minimal standards for maternal and child health (WHO, 2010). Between 2000 and 2009 there was an average of four hospital beds per 10,000 population, compared to an average of 10 in Africa and 63 in Europe (WHO, 2010; 2009). In 2007, government expenditure covered only 31% of total expenditure on health (WHO, 2010). A lack of money and distance to health facilities were among the main reported barriers to accessing healthcare (SLDHS, 2013).

Crisis Impact at National Level

The Ebola outbreak was declared in Sierra Leone on 25 May 2014, when the first case was reported from Kailahun district. The disease quickly spread to the capital Freetown and Kenema district. By July, more than half of all districts had reported at least one case of Ebola (WHO, 26/05/2014; 09/2014). As of 14 March 2015, 11,742 cumulative cases have been reported in Sierra Leone, including 3,687 deaths. Case incidence started to decline after a peak in November–December, and has more or less stabilised since February (WHO, 11/03/2015).

The toll Ebola has claimed on the health workforce, has dramatically decreased health facilities' capacity to provide adequate services. Reallocation of resources to combating the epidemic, a general lack of equipment such as essential medicines, and health workers' fear of working in facilities because of the risk of infection further decreased the level of service provision. Many facilities have been temporarily closed or used as Ebola care facilities. At the same time, fear of the population to come to health facilities, a general mistrust in the health system, and limited access due to movement restrictions resulted in a decrease in the number of patients reported for diseases other than Ebola (UNICEF, 03/12/2014; UNDP, 01/2015; UNDP, 12/2014).

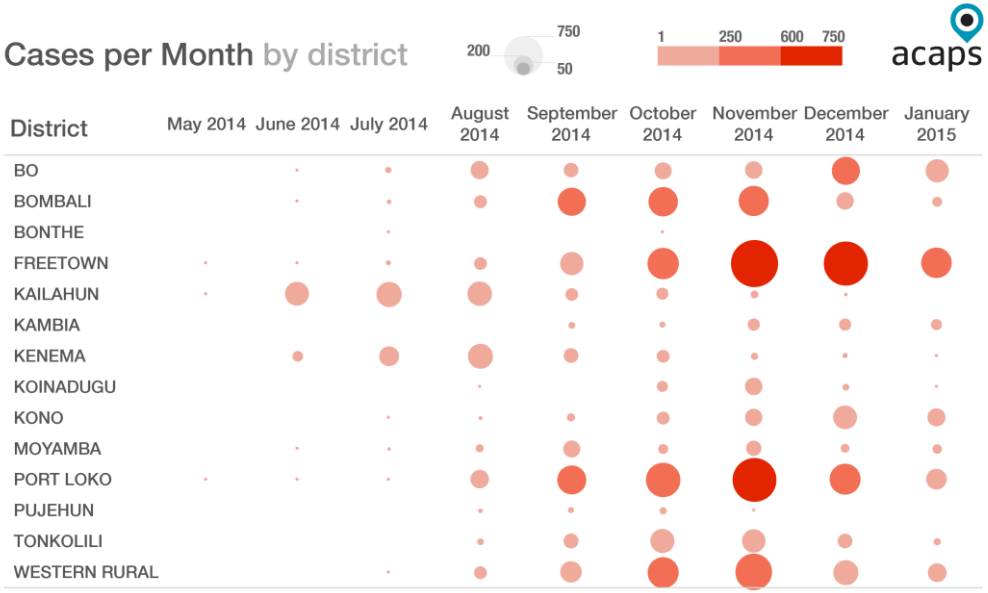


Figure 1 Ebola cases reported per month by district

Overall, the Ebola crisis has had a different impact on the utilisation of health services at the level of primary health facilities than at the hospital level, according to observers. There are few hospitals and they are generally not the first line of treatment facilities. Many private and public hospitals closed during the outbreak in all most affected districts (UNDP, 01/2015). Some were used as Ebola treatment or holding centres and had to suspend other activities. They could return to normal functions once other Ebola health facilities opened nearby and confidence in the facilities was restored.

Most PHUs stayed open during the outbreak. UNICEF found 4% of all PHUs closed during a survey in October, and another 4% had closed temporarily at an earlier point in the outbreak (UNICEF, 03/12/2014). Many PHUs have, however, been operating at reduced levels due to a lack of equipment and personnel, and many patients stayed away even when services were offered.

From April to November, a decrease in health service utilisation typically occurs because of the rainy season. In 2013, the lowest levels of health visits were seen in August. Long distances to health facilities, poor infrastructure and inadequate public transportation further decrease access to health facilities. While the onset of the Ebola outbreak coincided with the start of the rainy season, the fall in health service utilisation in 2014 far exceeds the anticipated seasonal decrease.

The data presented below was collected by the Sierra Leone Ministry of Health and Sanitation (MoHS), which estimates the data to be about 90% complete. However, no list of PHUs that have been reporting to the MoHS has been reviewed, making data consistency problematic. The data might be subject to underreporting due to temporary closure of facilities or lack of staff. Therefore, PHU activity may differ somewhat in reality from what is presented here. Because the Ministry may not yet have completed entering all information into the system, the data is subject to revision (MoHS, 24/02/2015).

Outpatient Department (OPD) Attendance

Though an increase in overall service utilisation occurred during the first six months of 2014 compared to 2013, most districts show a decline in OPD consultations starting July and August 2014, coinciding with the spreading Ebola epidemic. Some districts were starting to recover as of September and October, while in other districts the decline levelled off in September. The usual seasonal increase in October–November, as the rainy season comes to an end, was not observed in 2014. In fact, OPD consultations further decreased in November and December, as the Ebola outbreak in Sierra Leone reached its peak. Two maps on pages 8 and 9 show the decline in OPD consultations per district in June–December 2014 compared to the same period in 2013, and the number of Ebola cases per district. On average, the number of OPD consultations per 1,000 persons decreased by 29%.

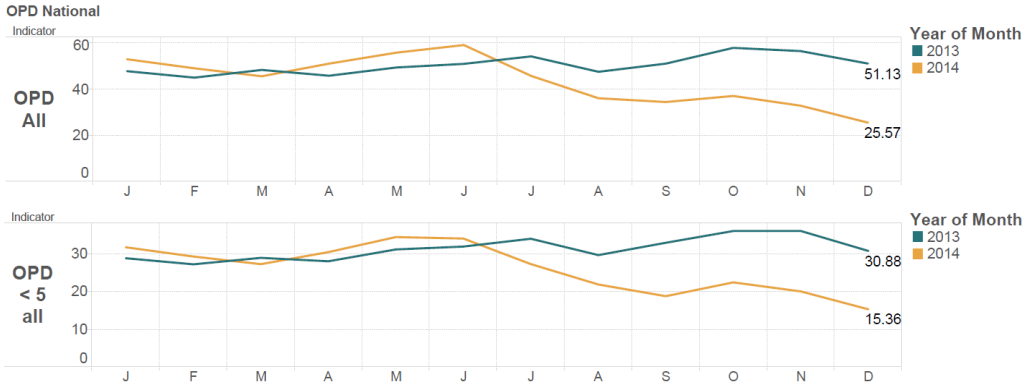


Figure 2 OPD visits per 1000 persons

A similar trend is observed for the number of OPD visits by children under five, which represents more than half of all OPD visits. Under-five OPD visits fell by 21% in 2014 compared to 2013, while the total number of OPD visits decreased by 18%. The large decrease in health service delivery to under-fives could have detrimental effects for already high child mortality rates in the country.

OPD attendance in Kenema, one of Sierra Leone's districts where the outbreak first occurred, seems to be the most affected by the Ebola outbreak, reaching a low in August 2014 of less than 4% of OPD visits compared to August 2013. This steep decline plateaued in September, but in December the reported number of OPD visits was still more than 20% below the number in December 2013. In Tonkolili, the cumulative number of OPD visits in 2014 was higher than in 2013, because more people came to PHUs in the first half of 2014. Starting in August 2014 the monthly number of visits declined, reaching below the levels observed in 2013 from October–December.

The decrease in certain districts can be partially attributed to a lack of reporting, especially in those showing the largest decline in OPD visits, including Kailahun, Kono, and Koinadugu. These districts show the largest decline in the number of OPD visits in proportion to the population over the year, but data is lacking for one or more months at the end of the year, meaning that the impact cannot be evaluated with certainty. Kailahun was actually showing signs of recovery, with an increasing number of reported visits in August, as the peak of the outbreak was coming to an end there. In November, the number of OPD visits had reached 99% of the number reported in November 2013. Health visits in Kono started increasing rapidly in October, after an initial drop in June. Here the outbreak reached its peak in November–December. However, a lack of data from these months makes further analysis impossible. The non-reporting might also be a consequence of the Ebola outbreak, due to scarce resources.

Malaria

Malaria is present year-round, but the number of cases increases as the rainy season progresses; they decline in November and reach a relatively stable level from December to April, the dry season. In June 2014, there was a deviation from this seasonal pattern. Reporting of suspected malaria cases declined rapidly until August. A further decline in suspected cases reported in November and December could partially be accounted for by the end of the rainy season. However, by December 2014, the number of suspected cases was only half the caseload reported in December 2013, indicating that malaria cases must go undiagnosed.

A decrease in the number of patients treated for malaria in 2014, with Artemisinin Combination Therapy (ACT) or quinine, is less pronounced. In early 2014, more patients were being treated for malaria in the community than in 2013, which suggests similarly higher levels of treatment could be expected during the malaria season. Yet this did not happen. By July 2014, the number of patients treated for malaria had dropped to below July 2013 levels, and they further decreased until September. From June – December 2014, the number of malaria cases treated had dropped by 17% compared to the same period in 2013.

The impact of Ebola on malaria treatment is being masked by generally low accessibility to adequate treatment. In 2013, only 14% of all suspected malaria cases were treated in the community. This rose in early 2014, but by December 2014, more than 80% of suspected malaria cases were not receiving treatment. According to UNICEF, the number of children treated for malaria declined by 39% between May and September 2014, compared to a 20% increase in the same period in 2013 (UNICEF, 03/12/2014).

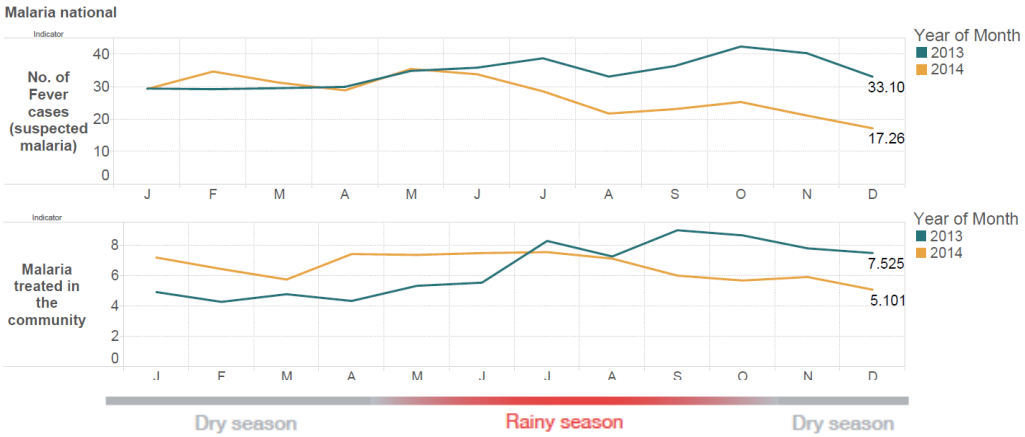


Figure 3 Suspected malaria cases and malaria cases treated per 1000 persons

The reported number of suspected malaria cases in Kailahun declined by 70% from May to October 2014, even though a seasonal increase was expected during those months. In Moyamba, declining case reports were greatest in August, when the number

of suspected cases had declined by more than 30% compared to 2013. In Kenema, the number of suspected malaria cases decreased dramatically from June. Between January and December 2014, the number of suspected cases had dropped by close to 80%.

Diarrhoea

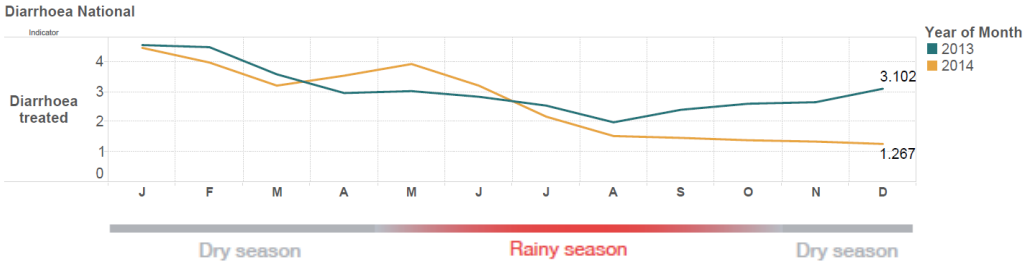


Figure 5 Diarrhoea cases treated per 1000 persons

After the peak of the rainy season the number of treated diarrhoea cases typically rises, and then decreases after February. The decline observed was much larger in 2014 than in 2013 in most districts. In July 2014, monthly diarrhoea cases treated in PHUs had fallen to below 2013 levels. The seasonal increase in cases treated in the facility expected from September was not reported in most districts, and case numbers remained at the low level reported in August. By December, the number of diarrhoea cases treated declined by 60% compared to December 2013. Kenema, Bo, and Tonkolili reported the largest decline in diarrhoea cases treated June-December 2014, compared to the same period 2013.

Diarrhoea affects mainly children under five, and in 2008 accounted for 21% of under-five mortality in Sierra Leone (WHO, 2010). The marked decline in diarrhoea cases treated in primary health facilities likely reflects a large increase in diarrhoea-related mortality in children.

Respiratory Tract Infections (RTI)

Overall, the number of RTIs treated at a PHU decreased by 14% in 2014 compared to 2013. A relatively stable number of cases was treated at PHUs over the course of 2014. At the district level, Western Area and Port Loko reported the most notable decrease in RTIs, which coincided with an increase in Ebola case numbers in August 2014.

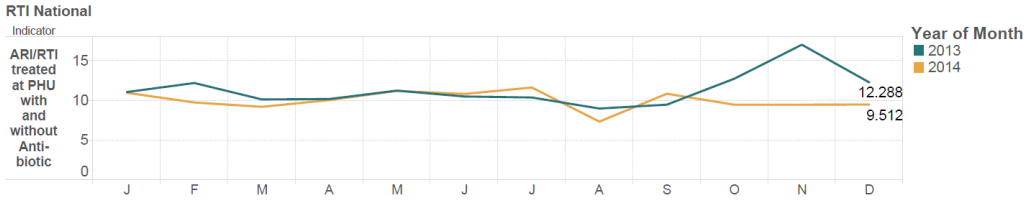


Figure 4 RTI cases treated per 1000 persons

Acute Malnutrition

2013 saw a steady increase in the number of children treated for acute malnutrition, with increasing admissions into outpatient therapeutic feeding programmes (OTP) and supplementary feeding programmes (SFPs). In July–August 2014, the reported number of admissions started declining and in September 2014 fell below levels reported in September 2013. The biggest declines were for SFPs, with an almost 50% reduction by December 2014, compared to December the year before. According to a national nutrition survey, 3.7% of children aged 6–59 months suffered from moderate acute malnutrition (MAM) in July and August 2014, and 1.0% from severe acute malnutrition.

In Port Loko district, a decrease in the number of children referred to SFPs was reported from August 2014. Between January and December 2014, the monthly admissions fell more than 70%. Kambia reported a decrease in children referred to SFPs from June. By December, the reported decline was more than 60% compared to January the same year. Port Loko and Kambia are the two districts with the highest MAM rates in 2014 (5.7% and 5.0%, respectively) (Government of Sierra Leone, Irish Aid and UNICEF, 10/2014).

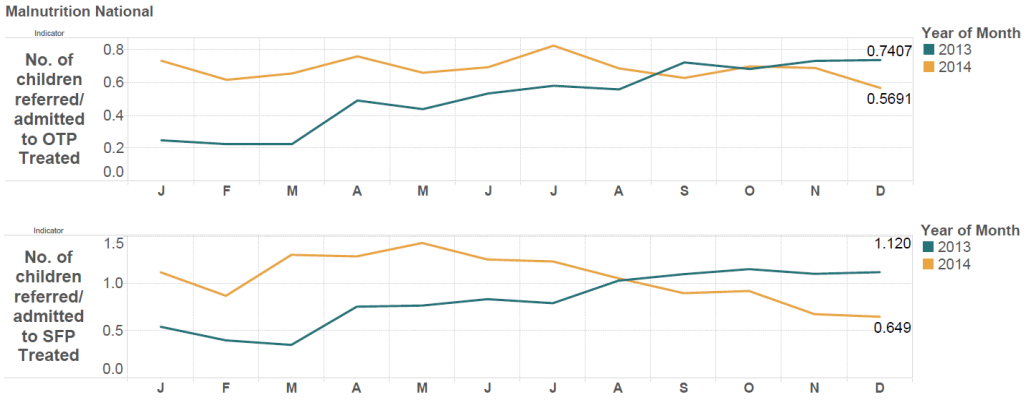


Figure 6 Acute malnutrition cases admitted per 1000 persons

Maternal Health

In the first six months of 2014, the more pregnant women had four antenatal care (ANC) visits than in 2013. Studies have shown that attendance to at least four ANC visits can

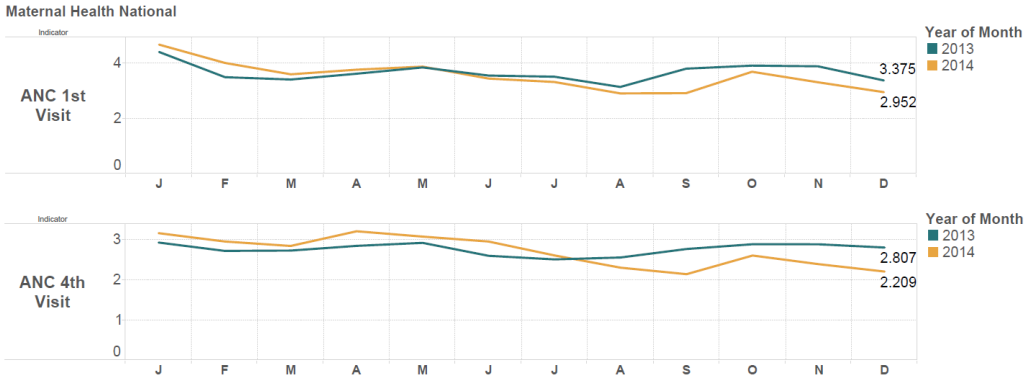


Figure 7 ANC visits per 1000 persons

significantly improve maternal and newborn health, as complications can be detected at an early stage and vitamins and other nutritional support can be provided (WHO, 2006).

In July, the number of women coming for their fourth ANC visit started to decline, falling to below 2013 levels in August. In a previous study, UNICEF reported a 27% decline in the number of women receiving four or more ANC visits between May and September 2014 (UNICEF, 03/12/2014). October showed some signs of recovery, but as Ebola cases increased rapidly in November and December, declines occurred again. Between January and December 2014, the number of pregnant women receiving four ANC visits declined by 30%. This means that about 52% of pregnant women had four ANC visits, compared to 75% before the epidemic (UNICEF, 2013). By December 2014, little more than half of pregnant women were coming to a PHU for at least one ANC visit, compared to 93% between 2008 and 2012 (UNICEF, 2013).

The number of deliveries conducted in PHUs started decreasing in July 2014. The lowest level was reached in September: 27% below the level in May. A similar decrease was reported in a by UNICEF (23%) (UNICEF, 03/12/2014). Signs of recovery in October were reversed by a second decline in November–December. Between January and December 2014, the number of deliveries conducted in PHUs decreased by 11%.

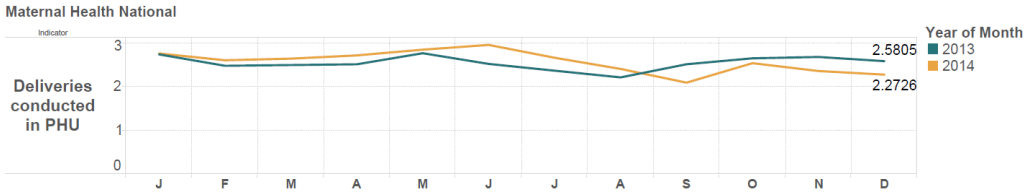


Figure 8 Deliveries conducted in PHU per 1000 persons

In 2013, 57.4% of women who delivered, did so in a health facility (SLDHS, 2013). The decrease reported here corresponds to half of all deliveries taking place in a PHU by December 2014. This decline might not lead to a large difference in delivery-related deaths in many districts, as very few deliveries were being conducted in health facilities even before the outbreak. However, in districts where many women were delivering in health facilities before the outbreak, such as Kailahun, Kenema, Bonthe and Bo, a decrease could have a big impact on maternal and perinatal mortality. As these data only show the impact on deliveries in primary health facilities, they may not reflect the full impact of Ebola on maternal and perinatal mortality, as they do not take into account decreased accessibility to secondary-level care in case of complications.

The districts with the largest decline in deliveries in PHUs coinciding with the onset of the Ebola outbreak are Kailahun (June) and Port Loko (August). Kailahun showed early signs of recovery starting in August. But by December 2014 the number of deliveries assisted in PHUs was still 14% below that of December 2013, reversing an increasing trend in the start of the year. In Port Loko, the number of deliveries in PHUs had decreased by 35% in December 2014, compared to December 2013. Port Loko also reported the largest decline in number of women receiving four or more ANC visits.

Immunisation

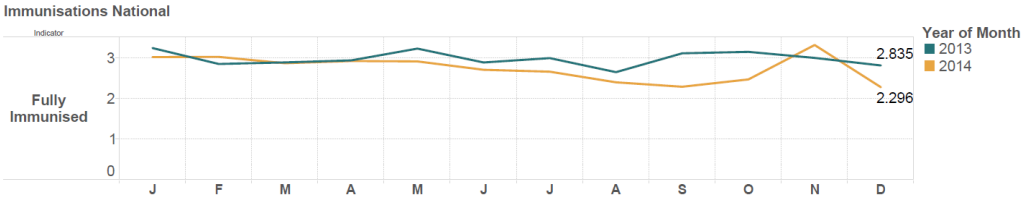


Figure 9 Fully immunised children <1 per 1000 persons

Sierra Leone has a vaccination programme in which children under 12 months should receive all recommended vaccinations.[1] The monthly number of children registered as receiving all their immunisations started decreasing in June 2014, coinciding with the onset of the Ebola outbreak. In September 2014, the proportion of children under 1 fully vaccinated was less than 75% of the proportion fully vaccinated in September 2013. In 2013, 68% of children had received all basic vaccinations, so a more than 25% decrease in the number of children corresponds to only about half of all children receiving all

[1] Fully immunised includes: BCG, measles and yellow fever, three doses of oral polio, pneumo conjugate and pentavalent vaccine, and two doses of rubella virus vaccine, all received according to schedule (MoHS).

vaccines (SLDHS, 2013). This is far below herd immunity levels, which is the level at which those who are not immune can be protected against outbreaks (WHO, 02/2008).

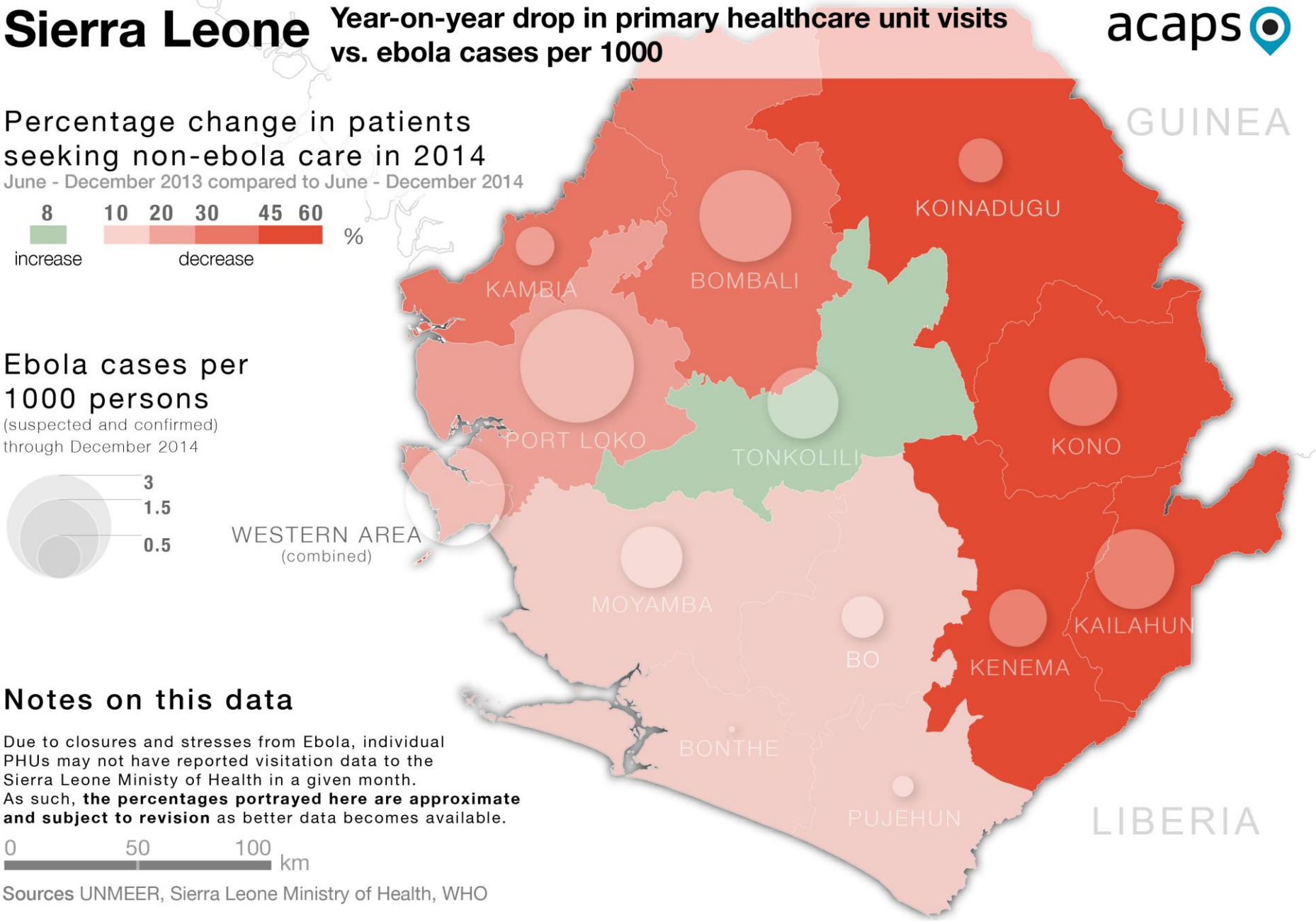
Through the end of 2014, national vaccination rates have remained markedly below 2013 levels. This poses a significant risk for child health. Measles coverage in December 2014 was 20% below that of December 2013. A 23% decrease was reported in the same period for a third dose of pentavalent vaccine.

In October 2014, some districts started recovering from the impact of Ebola and the number of children receiving vaccinations slowly increased, however, the MoHS still reported a 22% decline between May and December. UNICEF reported a similar 21% decline in the number of children receiving their third dose of pentavalent vaccine between May and September (UNICEF, 03/12/2014). Districts that have started recovering and where vaccination rates are improving include Kambia, since October, and Koinadugu, since November.

Infectious Diseases with Epidemic Potential

The number of reported cases of measles, Lassa fever, and meningitis decreased in the second half of 2014. As these diseases are endemic in Sierra Leone it is unlikely that fewer people are being infected. The decrease is probably the result of underreporting. A lack of health service delivery for such cases increases the potential for further transmission.

Maps Ebola Impact on Health Service Utilisation



Sierra Leone

Year-on-year drop in primary healthcare unit visits vs. total ebola cases

acaps

Percentage change in patients seeking non-ebola care in 2014

June - December 2013 compared to June - December 2014

8 increase

10 20 30 45 60 % decrease

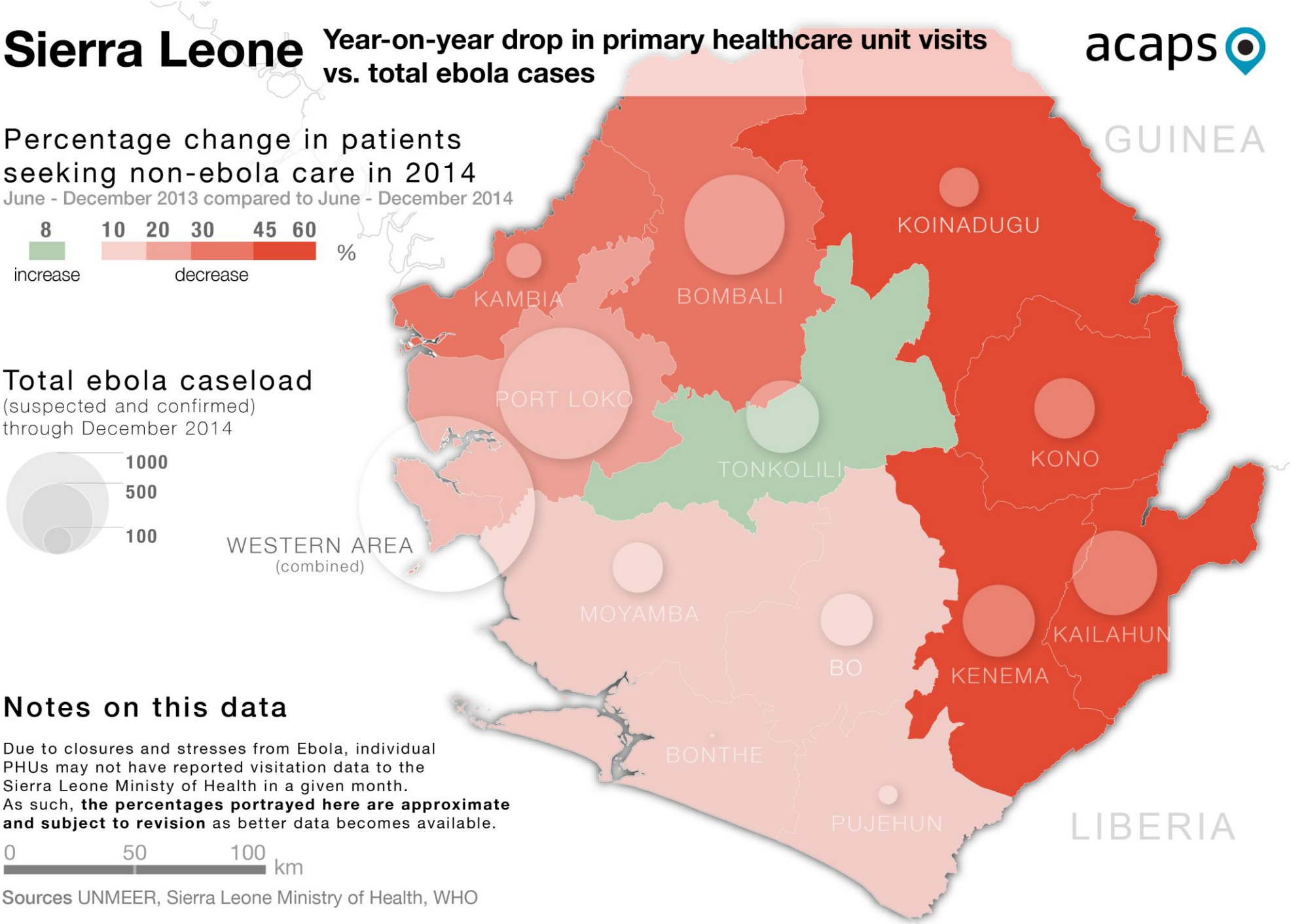
Total ebola caseload

(suspected and confirmed) through December 2014

1000

500

100



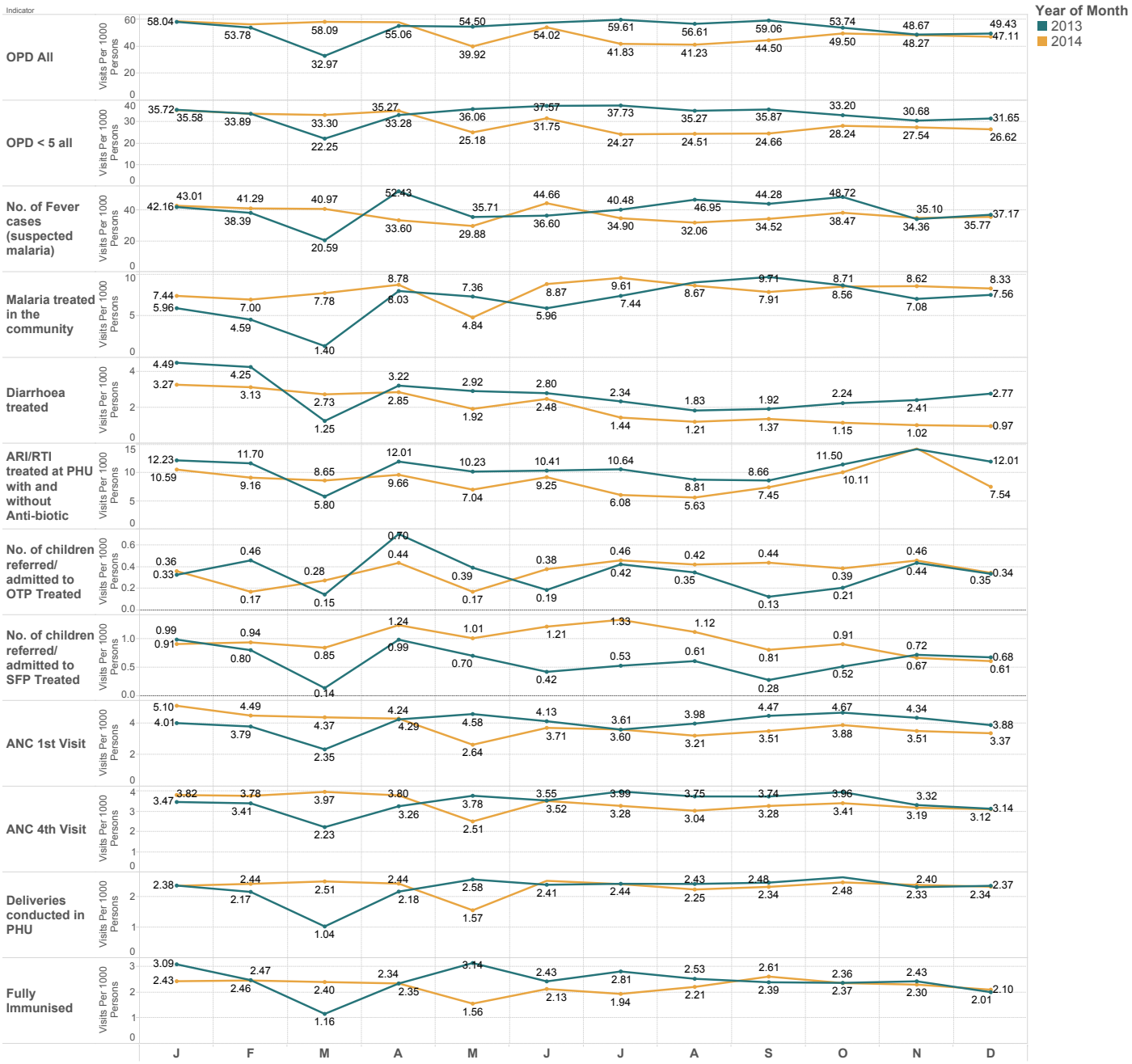
Notes on this data

Due to closures and stresses from Ebola, individual PHUs may not have reported visitation data to the Sierra Leone Ministy of Health in a given month. As such, **the percentages portrayed here are approximate and subject to revision** as better data becomes available.

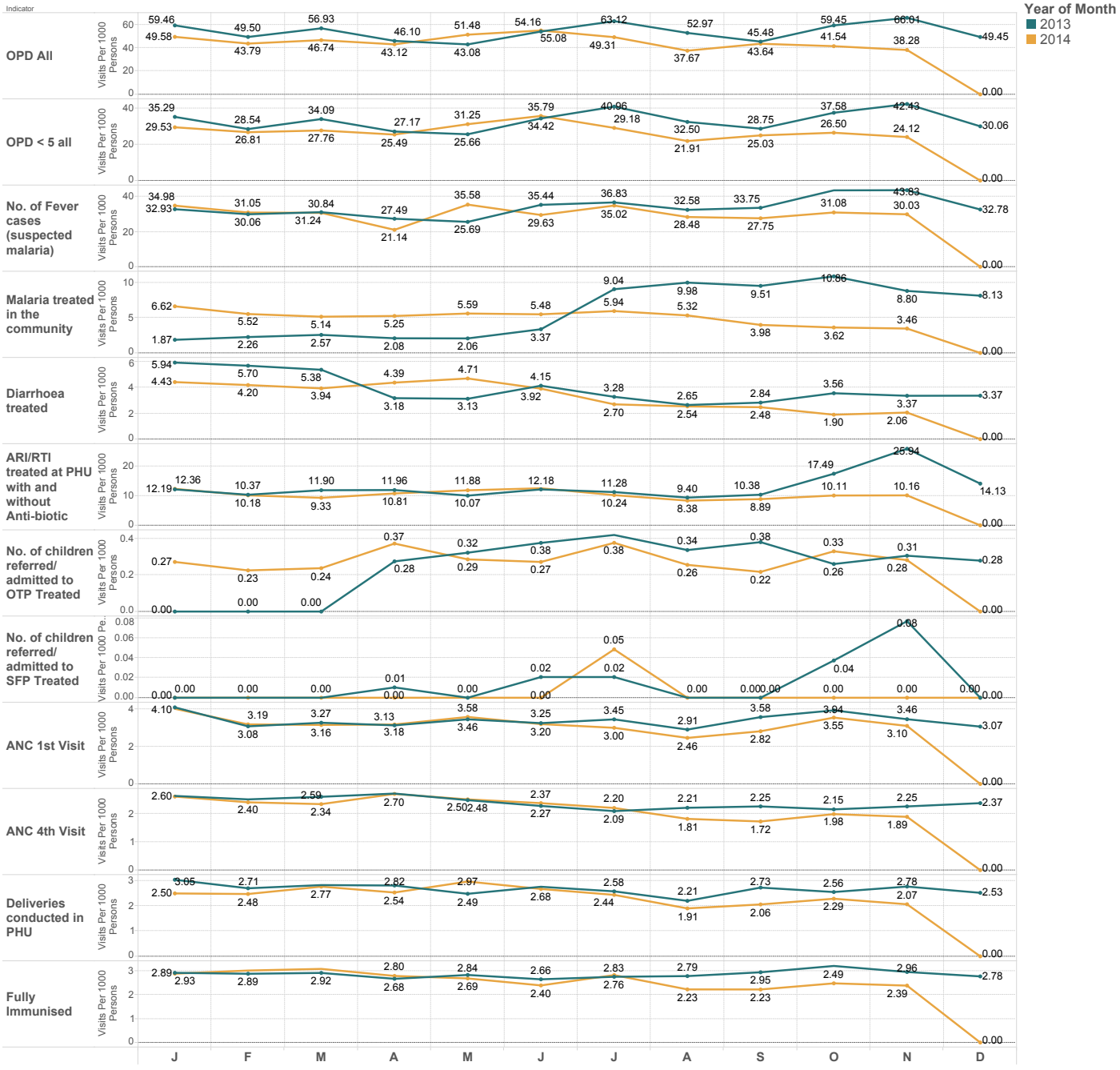
0 50 100 km

Sources UNMEER, Sierra Leone Ministry of Health, WHO

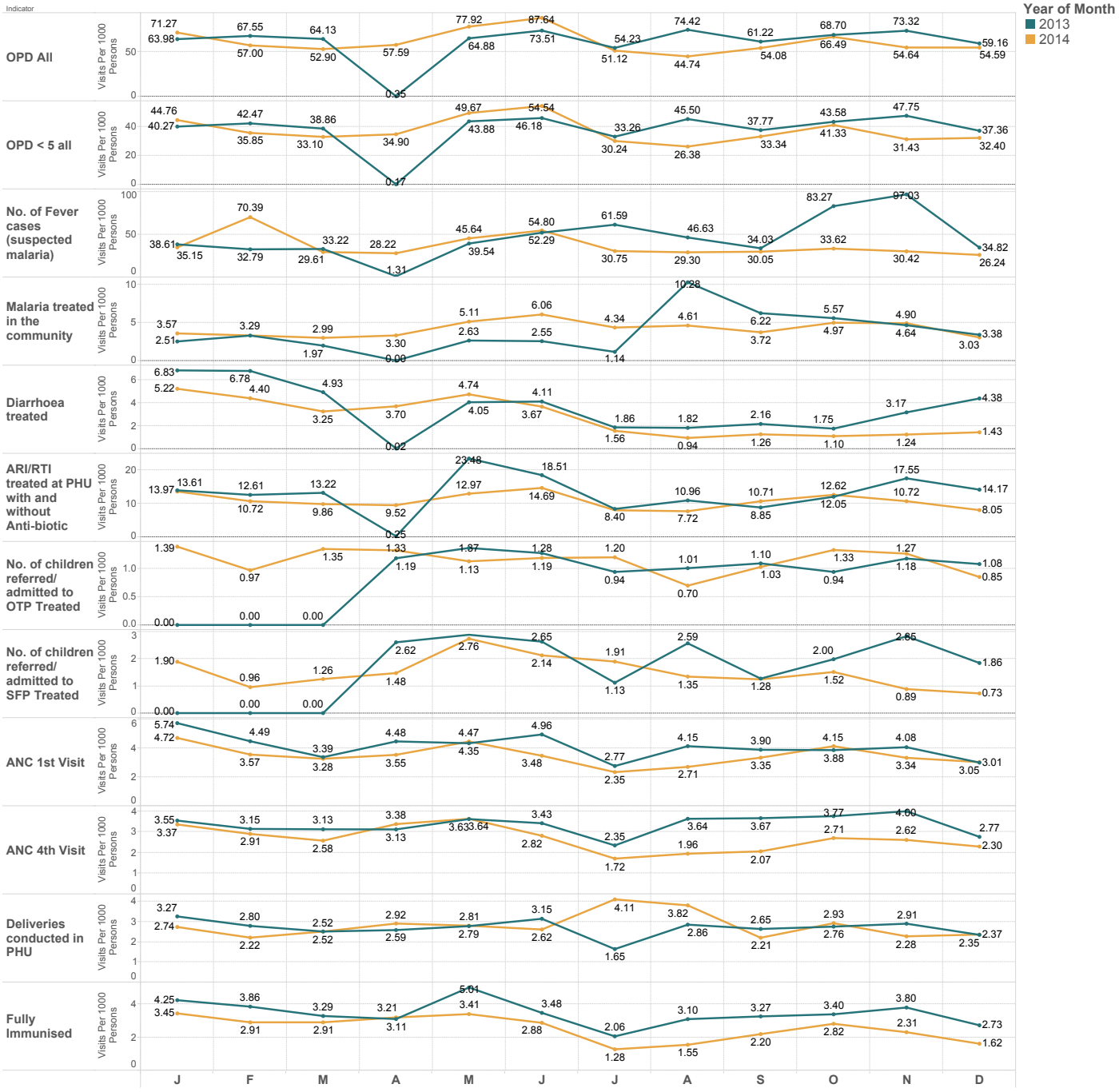
Bo


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J
F
M
A
M
J
J
A
S
O
N
D

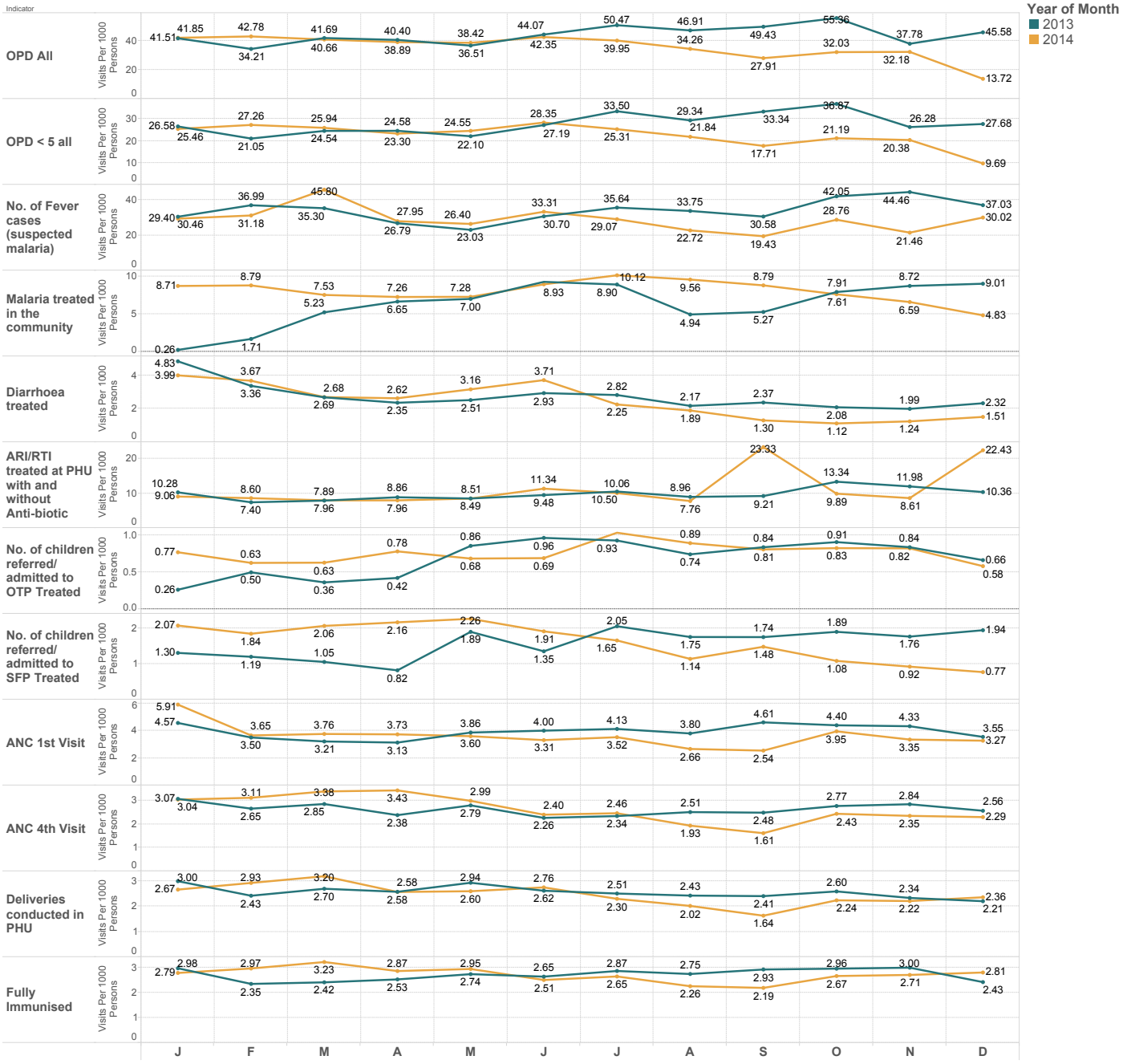
Bombali


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J
F
M
A
M
J
J
A
S
O
N
D

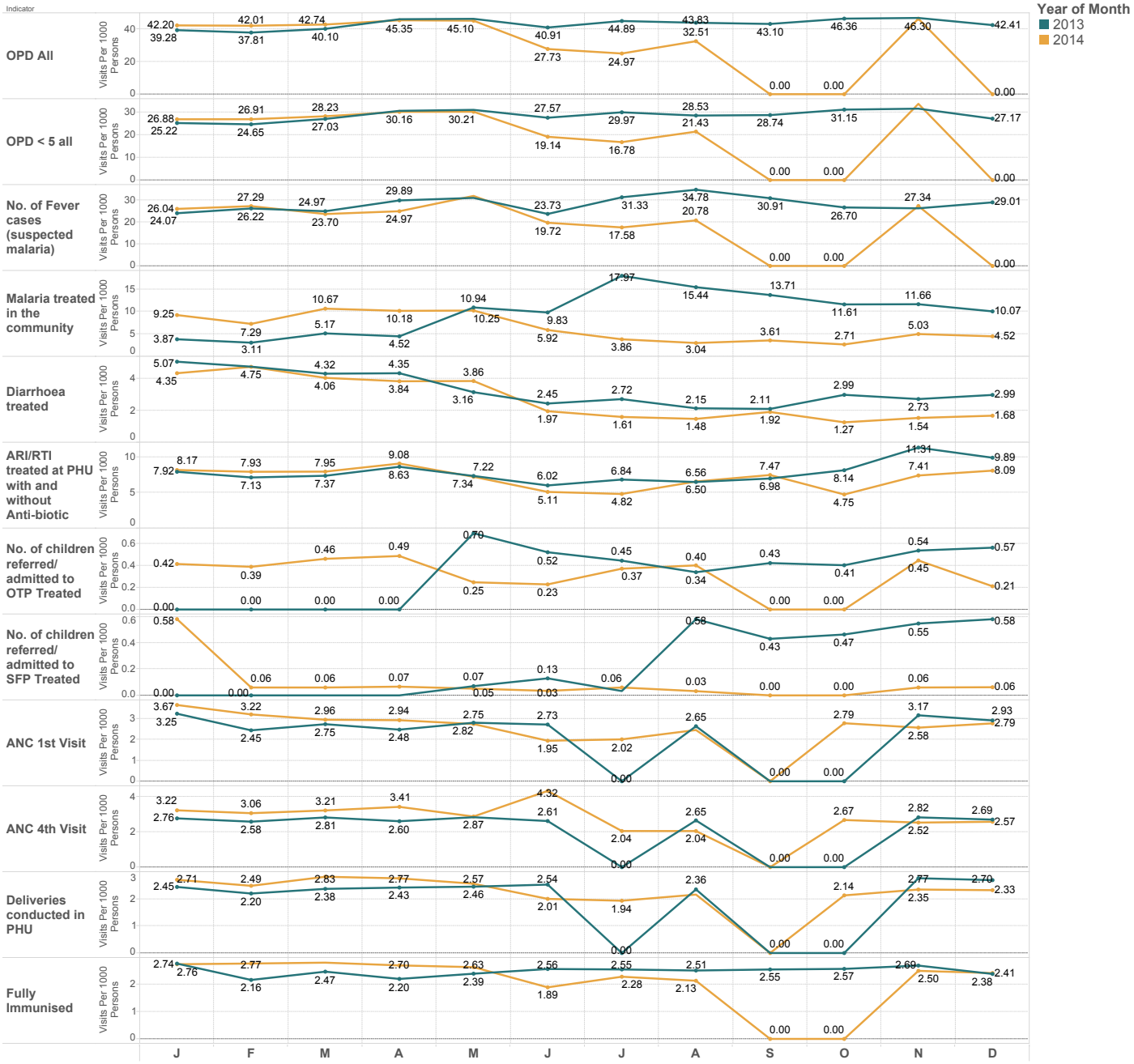
Bonthe


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J
F
M
A
M
J
J
A
S
O
N
D

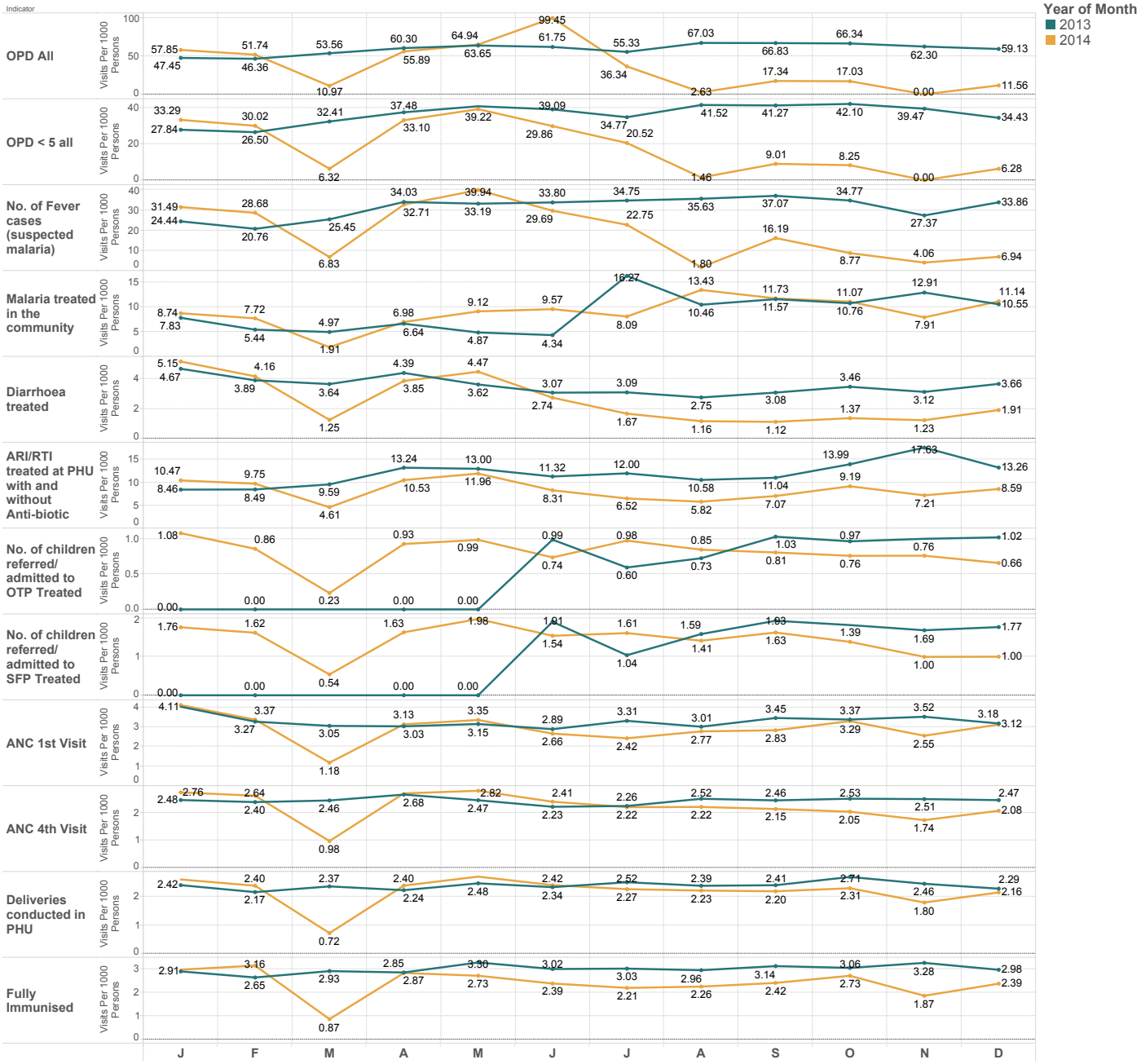
Kambia


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J
F
M
A
M
J
J
A
S
O
N
D

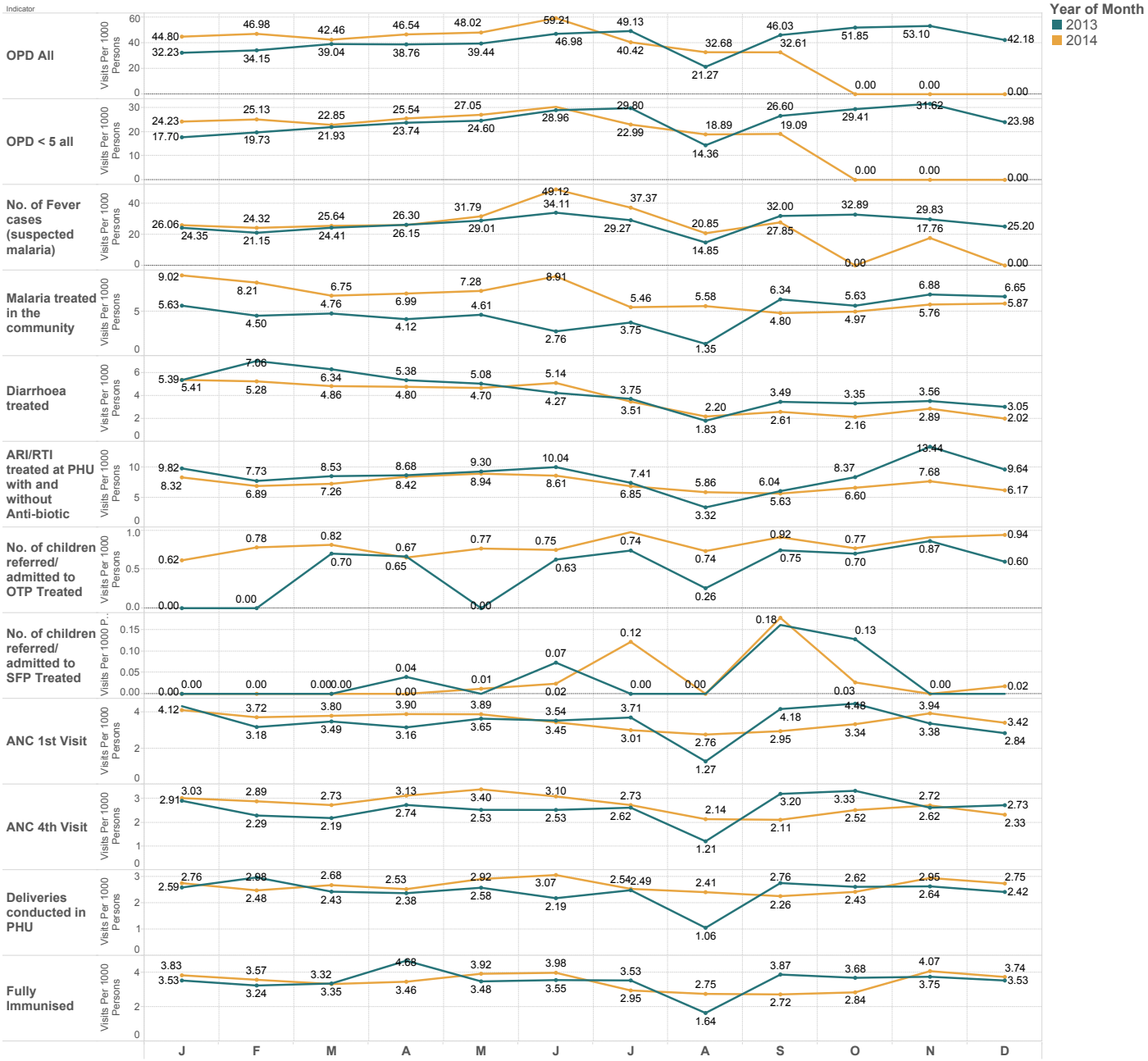
Kailahun


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J
F
M
A
M
J
J
A
S
O
N
D

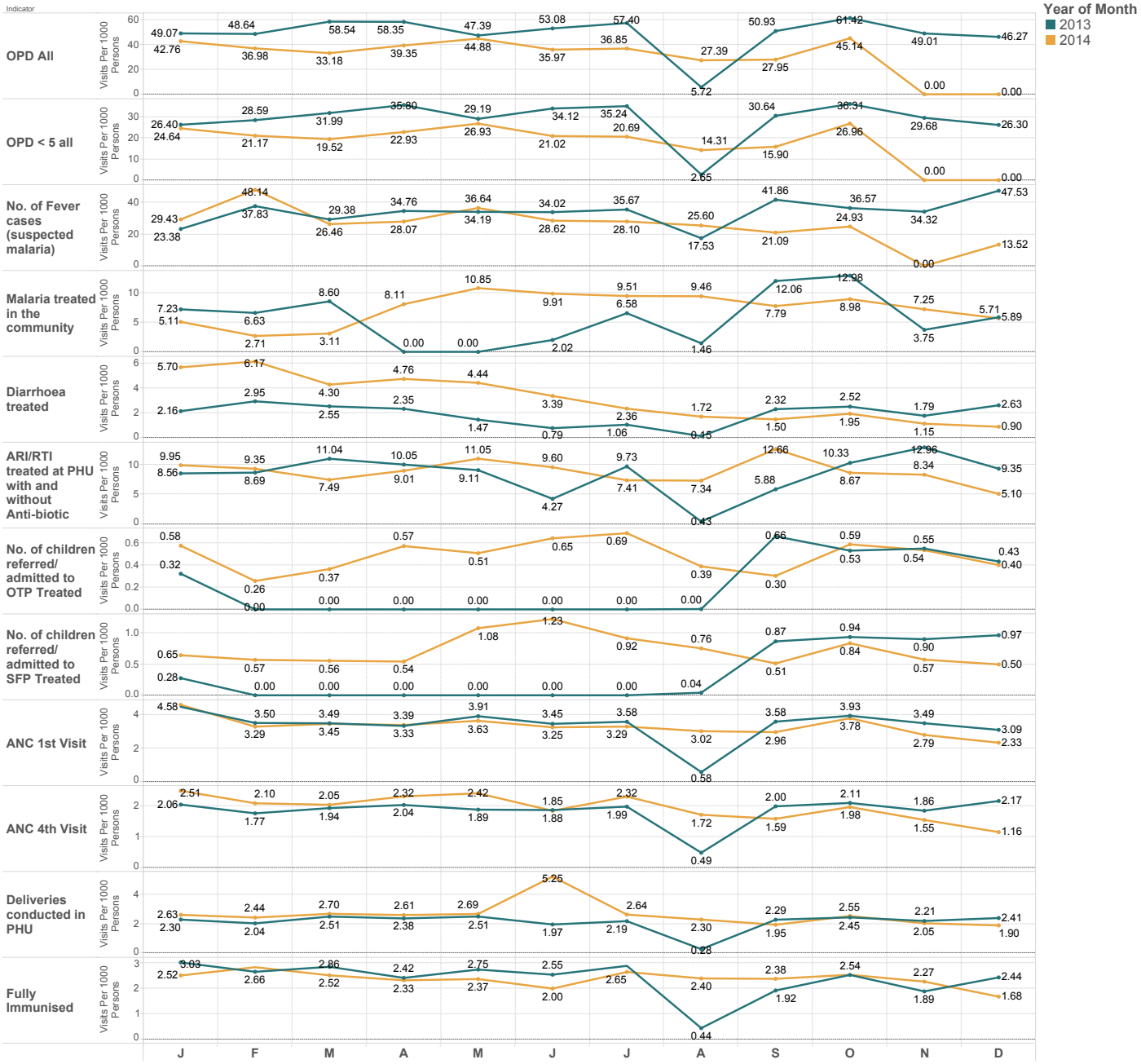
Kenema


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J
F
M
A
M
J
J
A
S
O
N
D

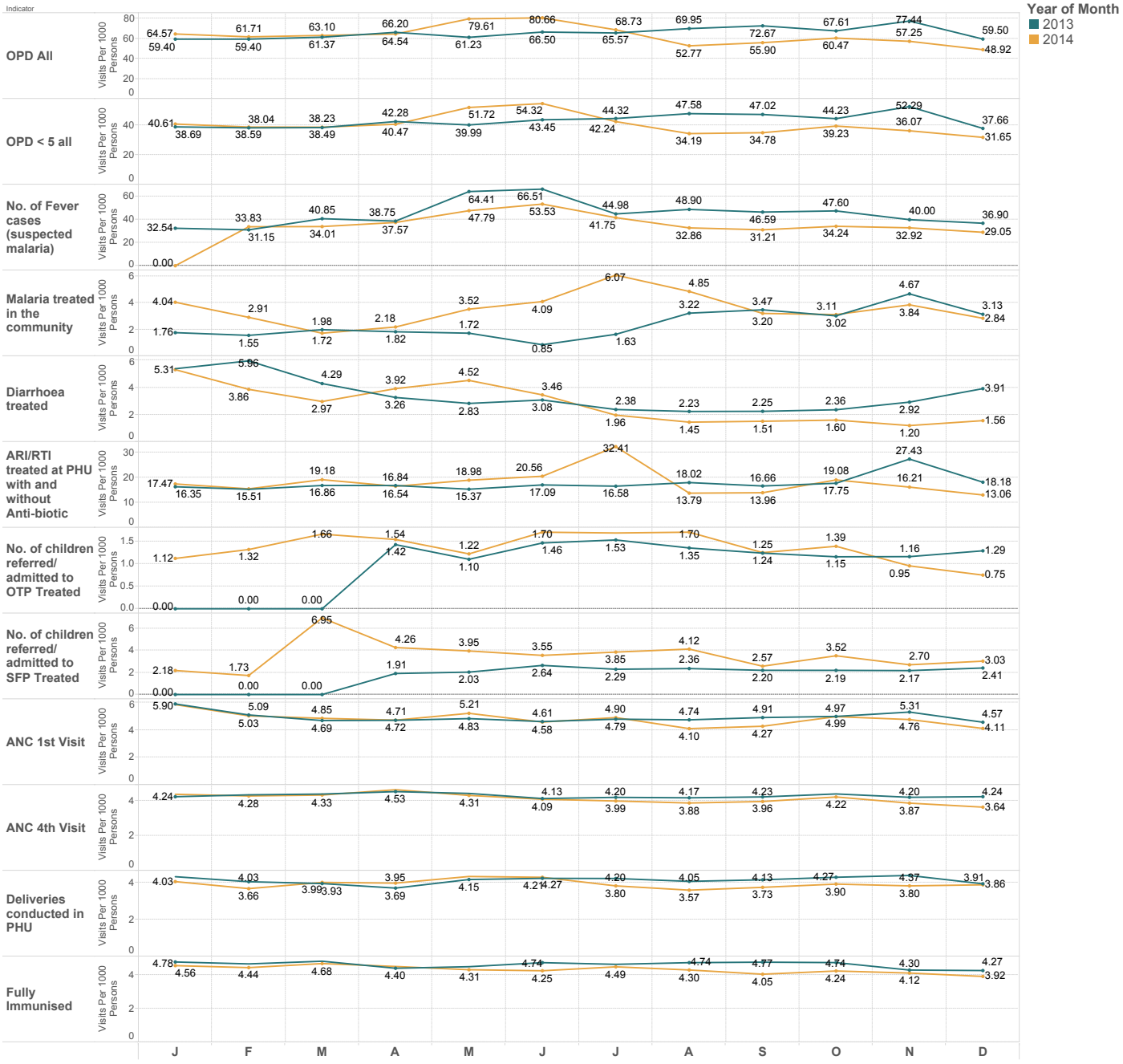
Koinadugu


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
Visits Per 1000 P.
J
F
M
A
M
J
J
A
S
O
N
D

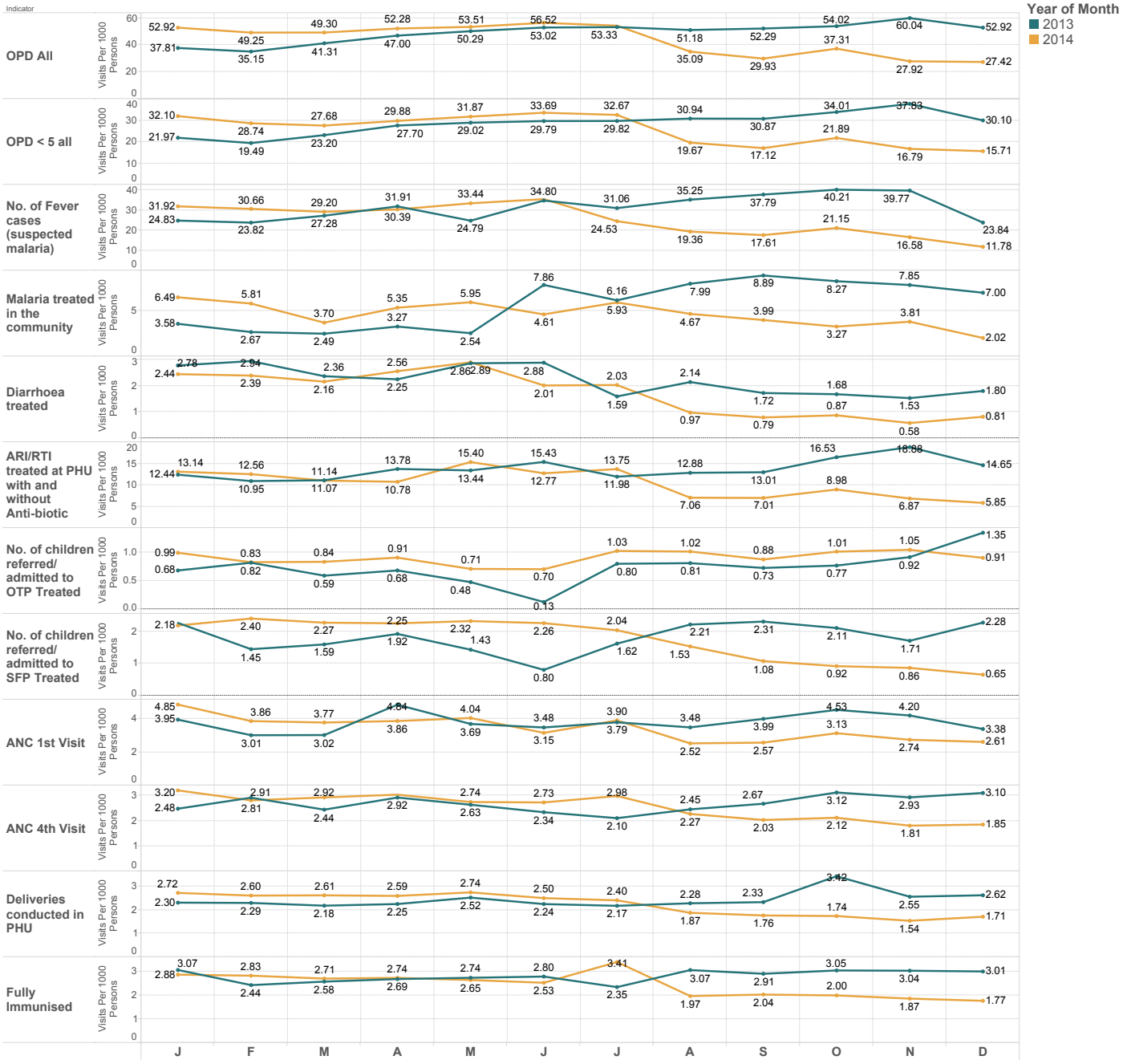
Kono


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J
F
M
A
M
J
J
A
S
O
N
D

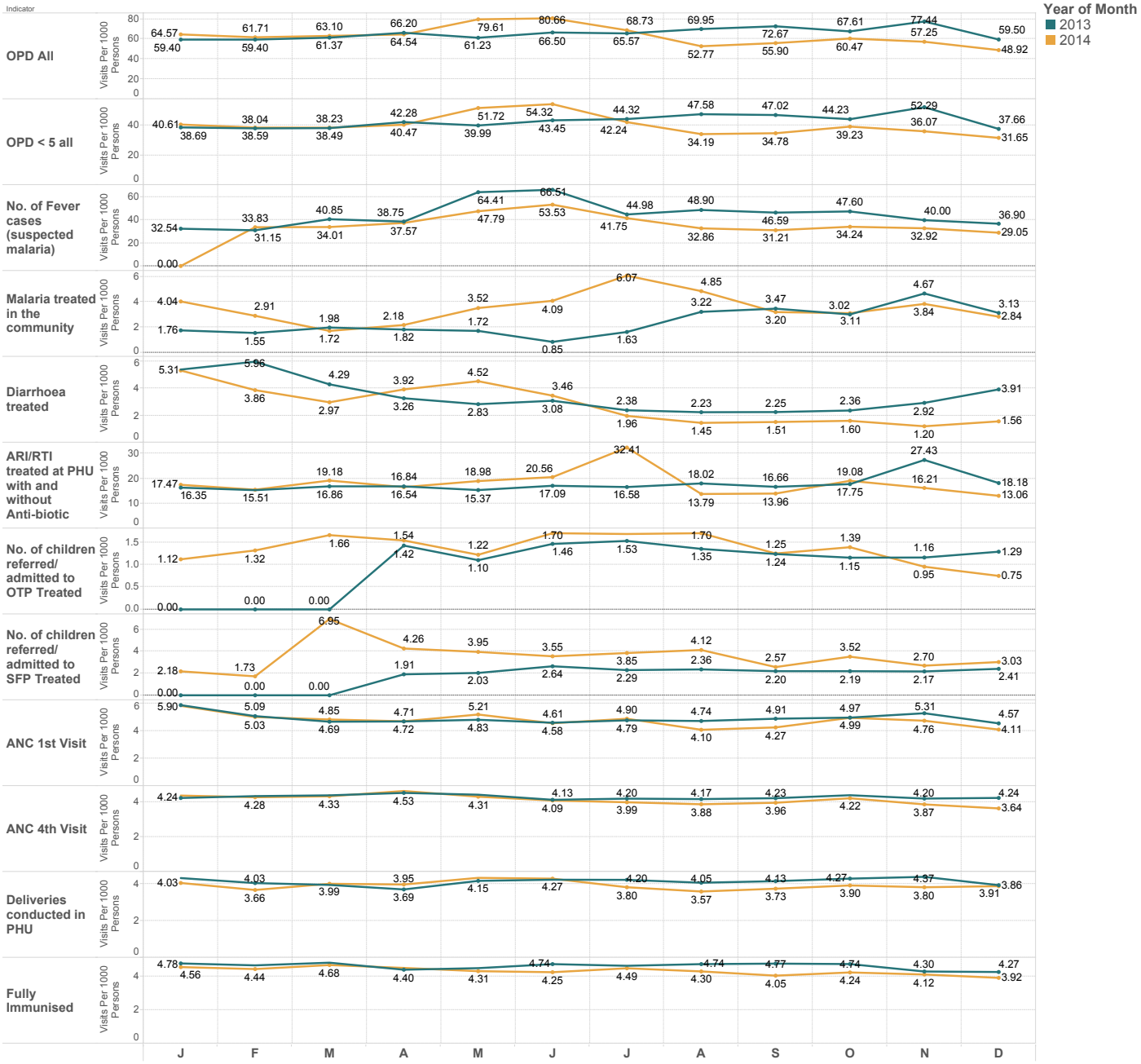
Moyamba


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J
F
M
A
M
J
J
A
S
O
N
D

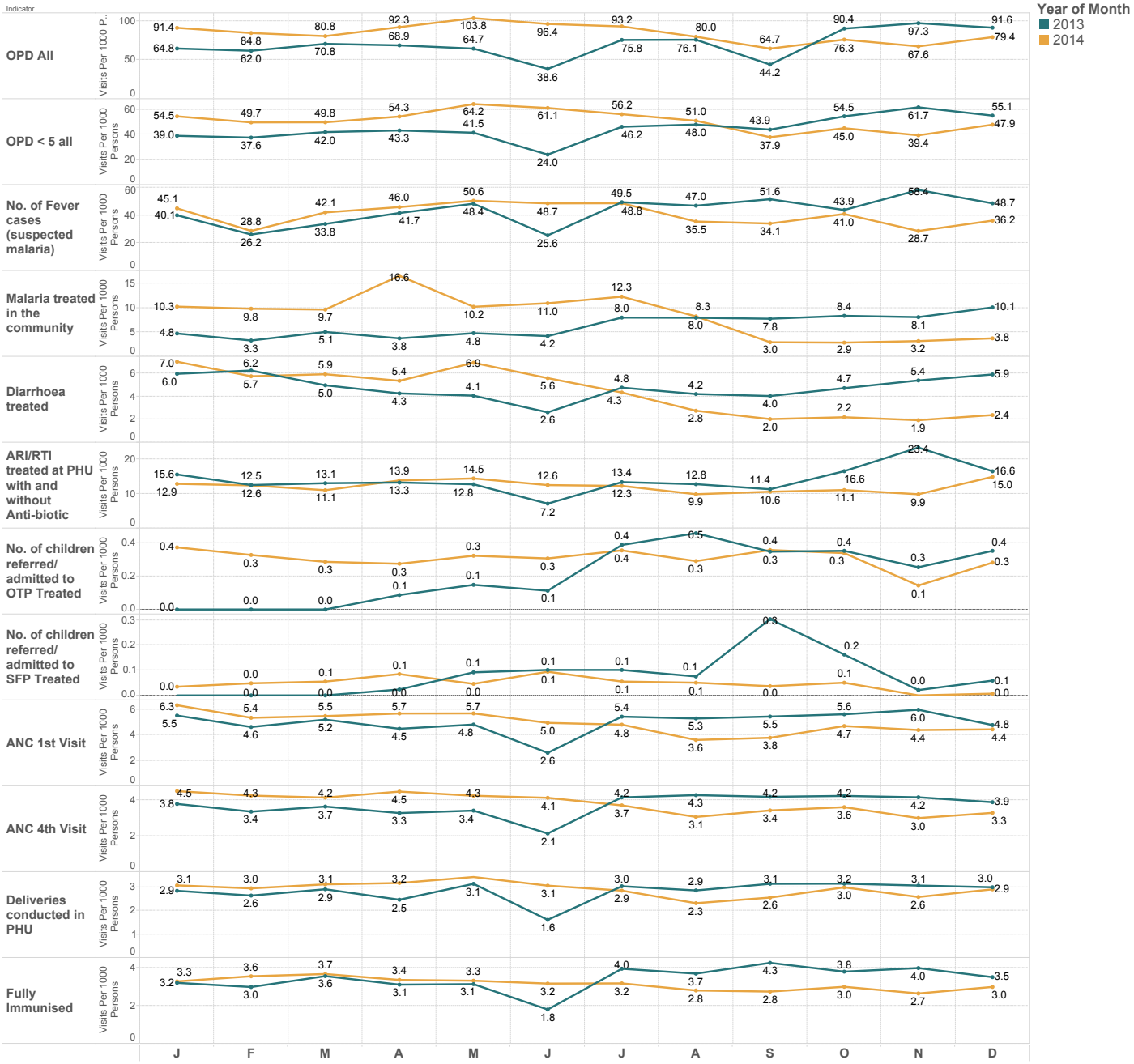
Port Loko


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J F M A M J J A S O N D

Pujehun


Indicator
Year of Month
2013
2014
OPD All
OPD < 5 all
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
Visits Per 1000 Persons
J
F
M
A
M
J
J
A
S
O
N
D

Tonkolili


Indicator
Year of Month
2013
2014
OPD All
Visits Per 1000 P...
OPD < 5 all
Visits Per 1000 Persons
No. of Fever cases (suspected malaria)
Malaria treated in the community
Diarrhoea treated
ARI/RTI treated at PHU with and without Anti-biotic
No. of children referred/ admitted to OTP Treated
No. of children referred/ admitted to SFP Treated
ANC 1st Visit
ANC 4th Visit
Deliveries conducted in PHU
Fully Immunised
J
F
M
A
M
J
J
A
S
O
N
D

Western Area