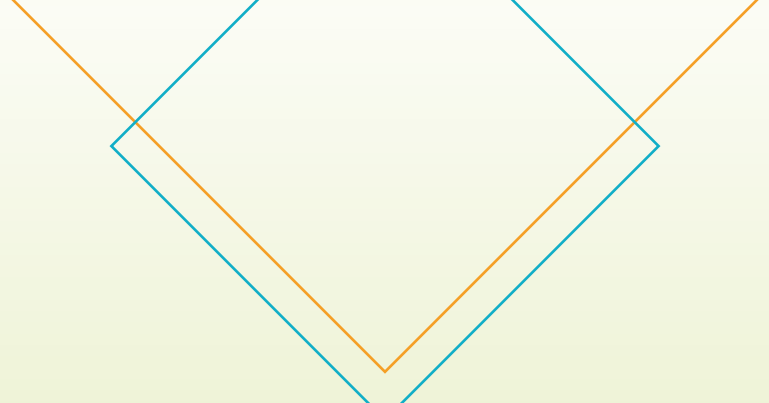




Impact of mobile health technology in improving the maternal and child nutrition services in rural Bihar, India



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INTRODUCTION

The maternal mortality ratio has been reduced by 38% since 2000 on a global level. Skilled care if provided to the women before, during and after the birth of the child helps in saving lives of mothers as well as children.

With an aim to reduce maternal and neonatal mortality, the Janani Suraksha Yojana (2005) Janani Shishu Suraksha Karyakram (2011), Integrated Child Development Scheme (1975) were launched by the government of India.

After the implementation of various schemes, institutional deliveries increased from 39% to 79% between 2005 and 2015 in India and from 20% to 64% in Bihar.

Regardless of the progress made towards maternal and child health, MMR and IMR in Bihar are 165 and 35 with full ANC coverage of 6.6 percent.

CONT. . .

Subsequently, Ananya was implemented by Bill and Melinda Gates foundation and Government of Bihar and ICT-CCS as an innovation to meet its objectives.



For scaling maternal and child health services, Government of Bihar and CARE India launched Integrated Family Health Initiative (IFHI) in eight high priority districts of Bihar (2011) later scaling up to all 38 districts (2013).



Later, CCS technology outcomes were reviewed and adopted by Ministry of Women and Child Development (WCD) that formed Common Application Software (CAS), an enhanced version of CCS.

RATIONALE

Some nutrition specific indicators were assessed between CAS and Non-CAS districts through the household survey data (HHS) from Round 10 and Round 11 in 2018 and 2019 respectively.

The current study aims to assess the impact of CAS application-based program on the nutrition indicators in Bihar.

• RESEARCH QUESTION •

- Has mobile technology improved the maternal and child health and nutrition indicators in the rural areas of Bihar or not?

• OBJECTIVE •

- ✓ To assess the impact of the mobile technology in improving the maternal, newborn and child health as well as nutrition indicators in rural Bihar.

LITERATURE REVIEW

S.NO	TITLE	AUTHORS	YEAR	KEY FINDINGS
1	Use of Mobile Technology by Frontline Health Workers to Promote Reproductive, Maternal, Newborn and Child Health and Nutrition: A Cluster Randomized Controlled Trial in Bihar, India	Carmichael SL, Mehta K, Srikantiah S, et al.	2019	This study depicted the use of m-health tool for the FLWs improved co-ordination, increased effectiveness of work and enhanced confidence with improved RMNCHN indicators and behaviors.
2	Continuum of Care Services for Maternal and Child Health using mobile technology – a health system strengthening strategy in low and middle-income countries	Balakrishnan R, Gopichandran V, Chaturvedi S, Chatterjee R, Mahapatra T, Chaudhuri I.	2016	The data from this study depicts that the mobile technology helped in strengthening of the health system with improved and enhanced service delivery quality with increased the coverage of selected indicators in the implemented district in comparison to the other districts and the previous year data.
3	Impact of M-Health Application Used by Community Health Volunteers on Improving Utilisation of Maternal, New-Born and Child Health Care Services in a Rural Area of Uttar Pradesh, India	Prinja S, Nimesh R, Gupta A, Bahuguna P, Gupta M, Thakur JS.	2017	This study conveys that after m-health intervention coverage of IFA supplementation, self- reporting of pregnancy and after delivery complications increased significantly. This intervention also helped in capacity building of FLWs.

Cont..

S.NO	TITLE	AUTHORS	YEAR	KEY FINDINGS
4	M-SAKHI-Mobile Health Solutions to Help Community Providers Promote Maternal and Infant Nutrition and Health Using a Community-Based Cluster Randomized Controlled Trial in Rural India: A Study Protocol	Patel AB, Kuhite PN, Alam A, et al.	2019	This study demonstrates that maternal and child health indicators can be improved with the help of mobile technology with increased efficiency of the staff and better engagement of the participants in rural areas.
5	Development and formative evaluation of an innovative mHealth intervention for improving coverage of community-based maternal, newborn and child health services in rural areas of India	Modi, D., Gopalan, R., Shah, S., Venkatraman, S., Desai, G., Desai, S., & Shah, P.	2015	The ImTeCHO intervention was found effective in improving the performance of FLWs with increased coverage of RMNCHN indicators. The impact of this intervention was accepted and found useful at the primary healthcare delivery level.
6	The Impact of an mHealth Voice Message Service (mMitra) on Infant Care Knowledge, and Practices Among Low-Income Women in India: Findings From a Pseudo-Randomized Controlled Trial	Murthy N, Chandrasekharan S, Prakash MP, et al.	2019	This pseudo randomized control trial described that mhealth voice messages helped in improving the knowledge among mothers about the infant care practices and impacted the infant health outcomes with better coverage of the indicators.

METHODOLOGY

STUDY DESIGN

Study data has been taken from Round 10 and Round 11 of household survey under IFHI project, by CARE.

STUDY SETTING

The survey was conducted in 538 blocks across all 38 districts of Bihar.

STUDY DURATION

The Round 10 and Round 11 of the household survey were conducted in (Sept-Nov) 2018 and (Sept-Nov) 2019 respectively.

SAMPLE SIZE

The overall sample size across all the districts was 15,687 that resulted in the number of respondents up to 78,435 at the state level.

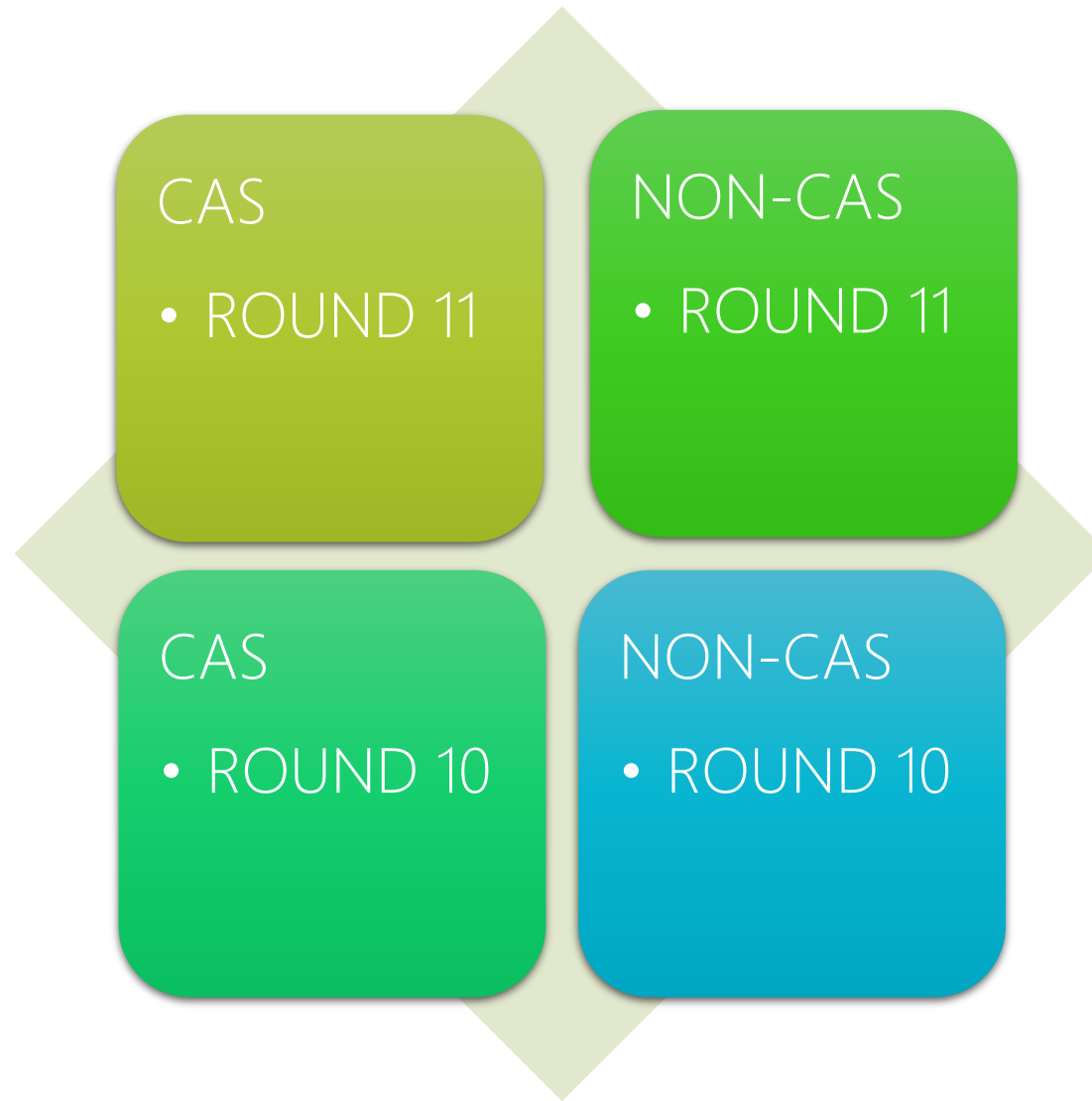
STUDY POPULATION

It included mothers of the infants living in rural areas of Bihar, divided into 4 subgroups having mothers of 0-2m, 3-5m, 6-8m and 9-11m old infants.

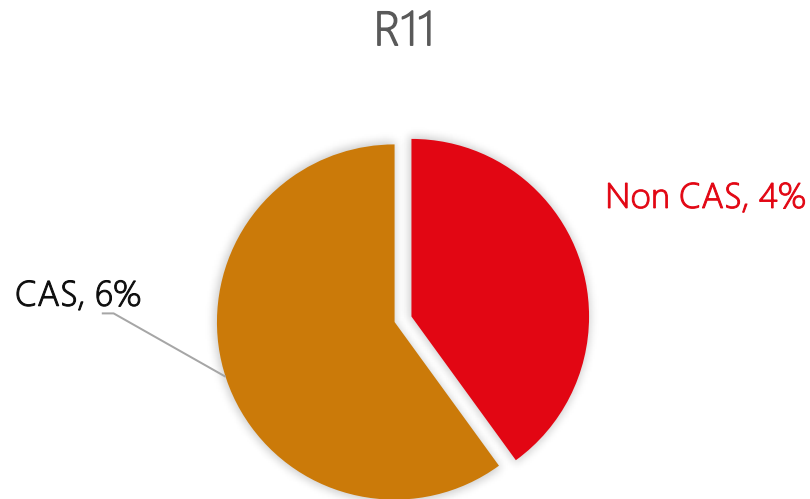
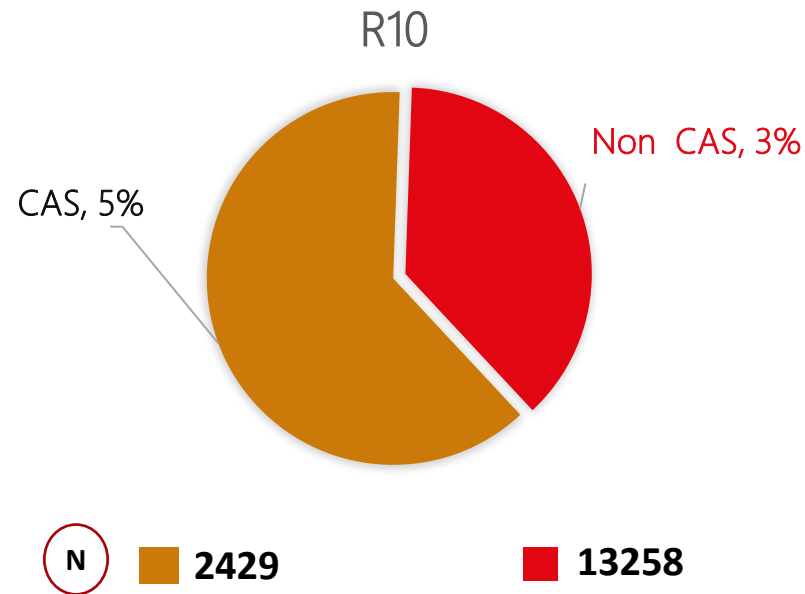
RESEARCH INSTRUMENT

For each subgroup of the selected respondents, there was a separate questionnaire, and interviews were conducted in each selected block.

RESULTS



First visit of Anganwadi worker during 1st trimester

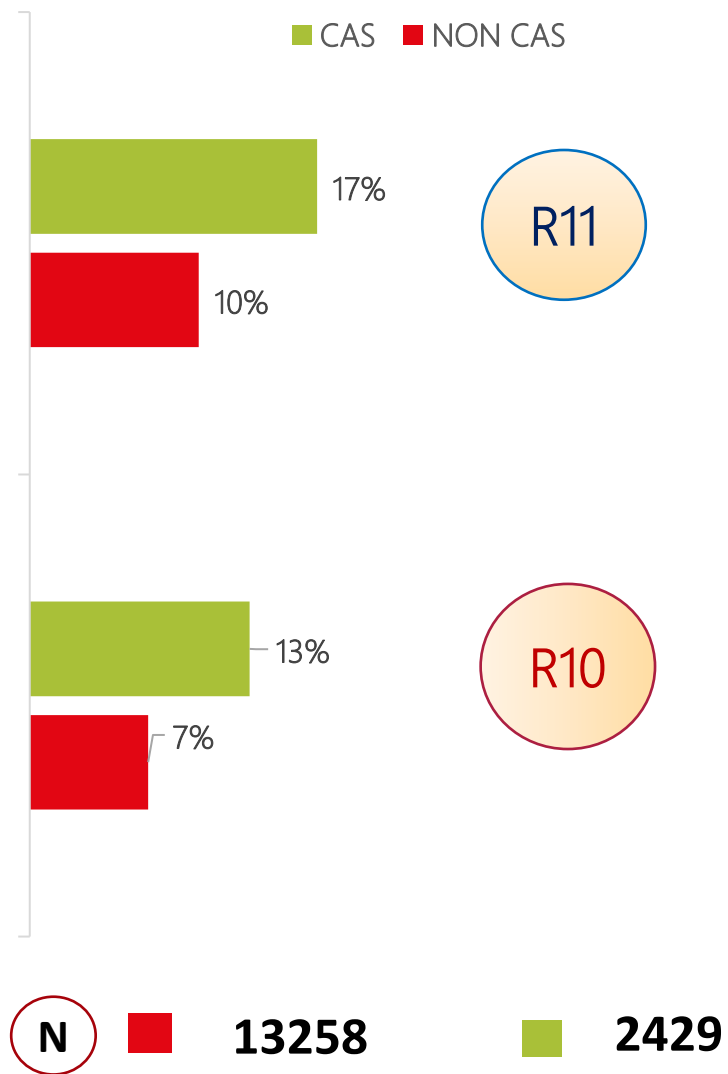


INTERPRETATION

While considering AWW visits to the mothers during the first trimester, the proportion was higher (5%) in CAS districts in Round 10 (4.29-6.44) in comparison to non-CAS districts (3%) (2.47-3.06).

This proportion again increased with time in CAS districts (6%) in Round 11 (5.10-7.39) and non-CAS districts having (4%) less proportion (3.37-4.06).

Mothers visited at least once by Anganwadi worker during pregnancy



INTERPRETATION

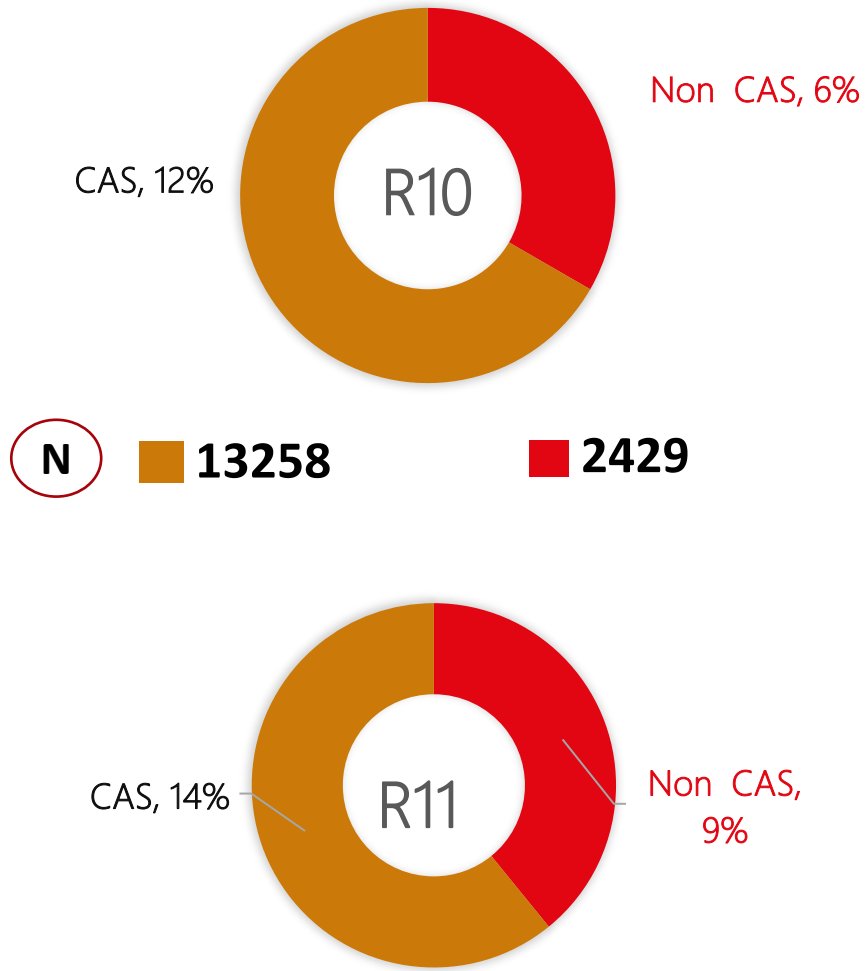
The proportion of mothers visited at least once by the AWWs during the pregnancy period was considerably higher in the CAS districts during both the rounds.

In Round 10, the CAS districts were having 13% mothers who were visited at least once (11.76-15.07) by the AWWs and the proportion was just 7% in non-CAS districts (6.88- 7.84).

This proportion increased again in Round 11 for CAS (17%, 14.83-18.30) as well as non-CAS districts (10%, 9.75-10.86).

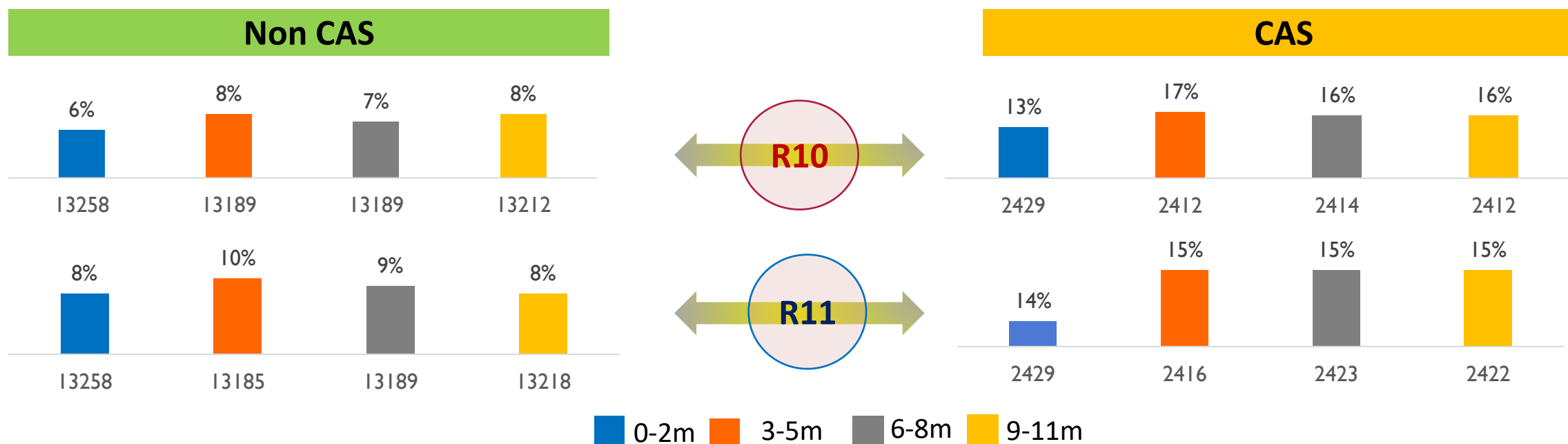
Mothers visited by Anganwadi workers in their last trimester

INTERPRETATION



The visits by AWWs in the last trimester also play a vital role in the pregnancy outcome. In third trimester, CAS districts again had a better proportion (ie 12%) in comparison to the non-CAS districts (6%) in Round 10 and in Round 11, the proportion in CAS district increased again (14%) having better proportion than the non-CAS districts (9%).

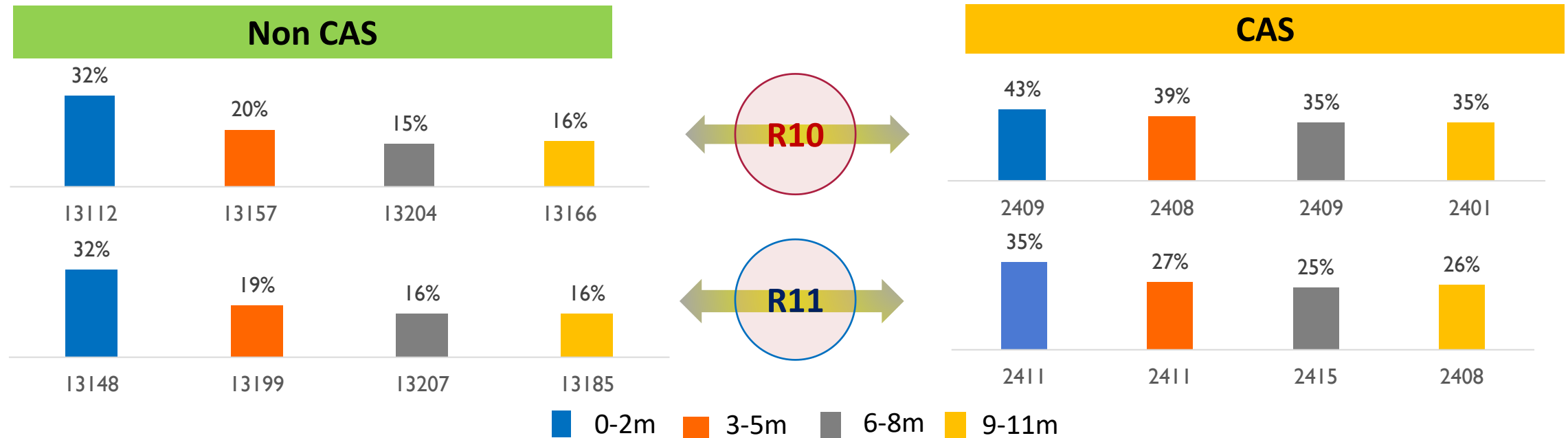
Mothers visited at least once by Anganwadi workers after delivery



INTERPRETATION

After delivery, the proportion of mothers who were visited at least once by AWWs were almost double (ie. 13%, which was 6%, in non-CAS districts in 0-2 months age group) in Round 10 in CAS districts. This proportion was again considerably higher in Round 11 again among the CAS districts in all age groups (from 0-11 months).

Child's weight measured by Anganwadi worker during previous month

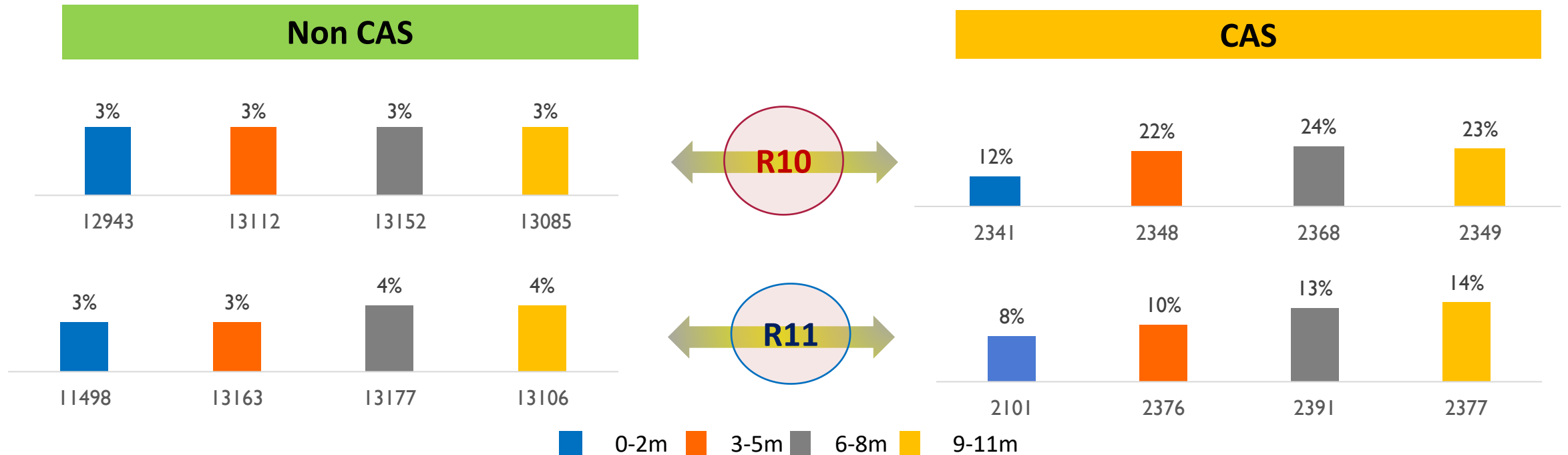


INTERPRETATION

The proportion of mothers having children whose weight (43%, 40.91-45.48) was measured during the previous month by the AWWs was significantly higher in all age groups (0-11 months) in the CAS districts in Round 10 comparatively.

However, a decline was observed in Round 11, in CAS districts (weight- 35%, 6.39-9.01) while the proportion was same in non-CAS districts (weight- 32%, 30.72-32.45) in comparison to the last year.

Child's height measured by Anganwadi worker during previous month

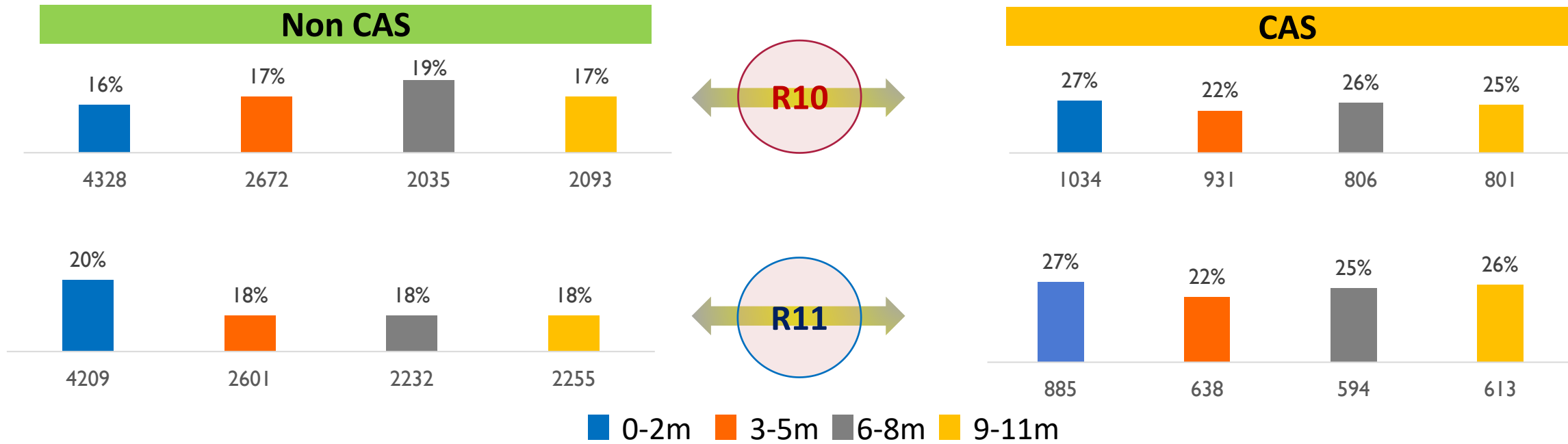


INTERPRETATION

The proportion of mothers having children whose height (12%, 10.54-13.60) was measured during the previous month by the AWWs was significantly higher in all age groups (0-11 months) in the CAS districts in Round 10 in comparison to the non-CAS districts.

In comparison to the previous year, there was a decline in the proportion of height measurements in Round 11, in CAS districts (8%, 2.65-3.32) while the proportion was again similar in non-CAS districts.

Received any advice by Anganwadi workers for child whose weight and height were measured

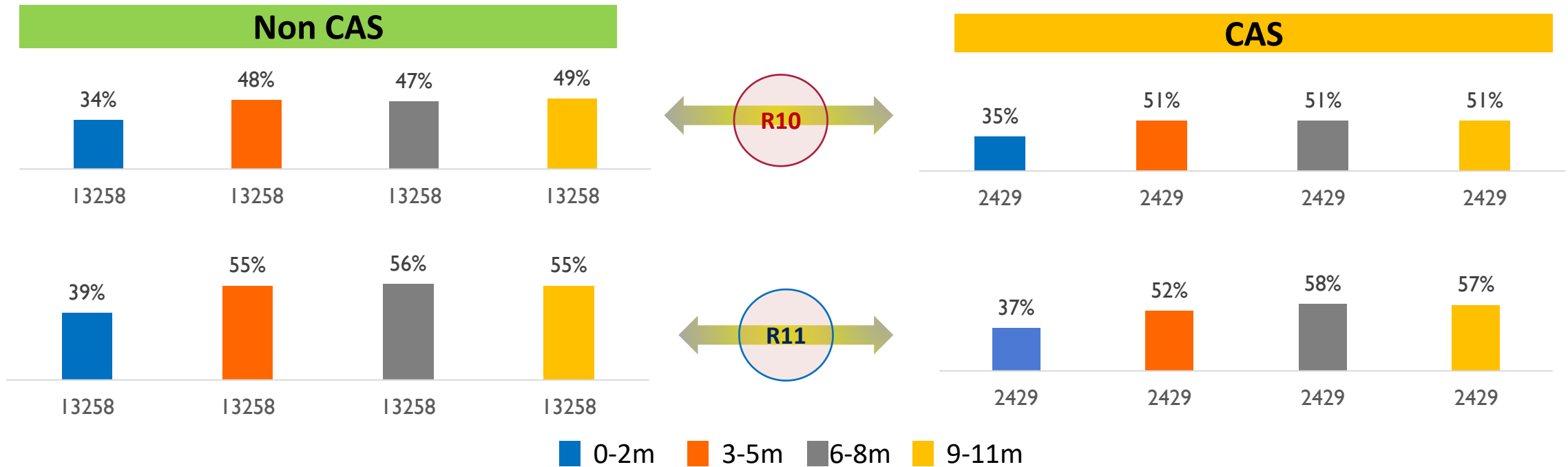


INTERPRETATION

Among the children whose weight and height were measured, the proportion of households receiving advice from the AWWs was better among the CAS districts again, in all age groups (0-11 months) in Round 10 whereas the non-CAS districts were having a low proportion comparatively.

In Round 11, the proportion was higher in CAS districts. In non-CAS districts, the proportion was comparatively low.

Received Take Home Ration after delivery



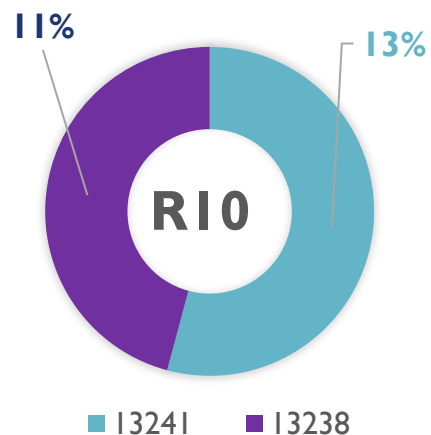
INTERPRETATION

This data infers that proportion of women taking take home ration after delivery was slight high in CAS districts in all age groups in Round 10 (0-11 months) whereas the proportion in non-CAS districts was comparatively lower.

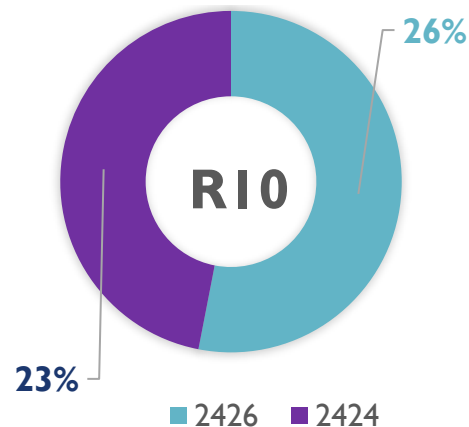
There was a decline in the proportion in CAS districts in comparison to non-CAS districts with time (0-5 months, Round 11). The proportion was again high in 6-8 and 9-11 months age group in CAS districts.

Mothers participating in a demonstration of feeding/preparing food diversity

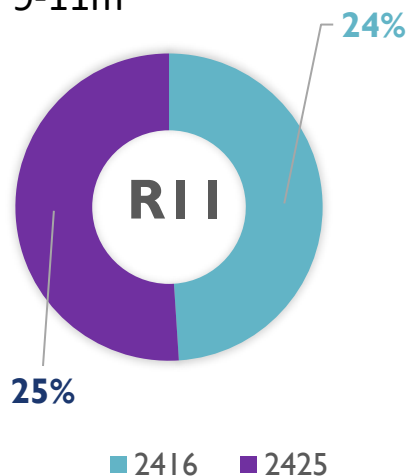
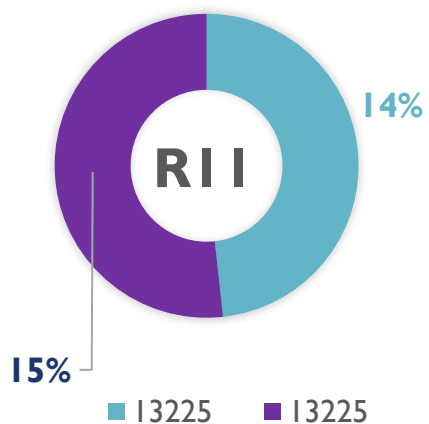
Non CAS



CAS



■ 6-8m ■ 9-11m



INTERPRETATION

In CAS districts, the proportion of mothers participating in preparing dietary diversity was- 26% and 23% respectively. In non-CAS districts, the proportion was- 13% and 11% respectively.

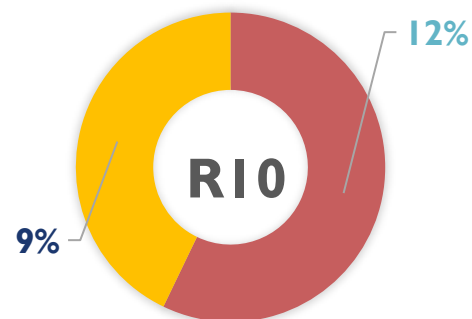
During the next round, the proportion was again significantly higher in the CAS districts. It was 24% and 25% in 6-8- and 9-11-months age group in CAS districts while in non-CAS districts, the proportion was 14% and 15% respectively.

Mothers attending Complementary Feeding day event

Non CAS

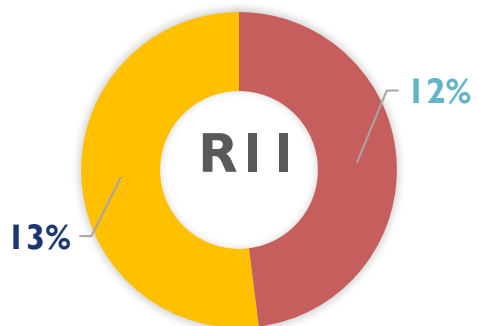
CAS

6-11m

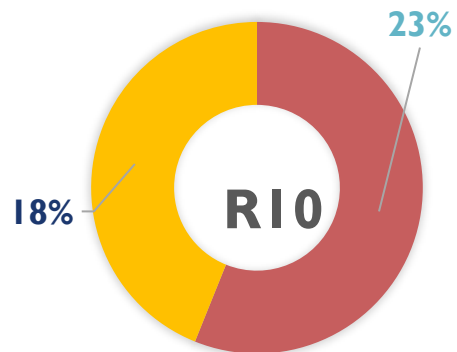


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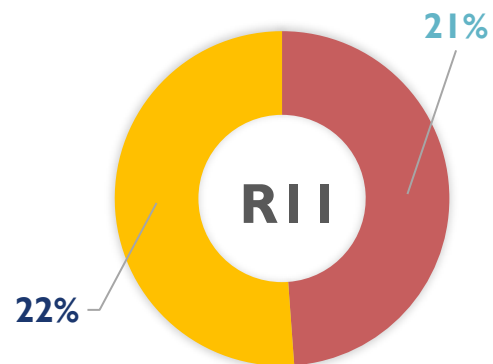
6-8m 9-11m



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INTERPRETATION

The proportion of women attending the complementary feeding day session was almost double in the CAS districts, in Round 10 in 6-11 m age groups in comparison to non-CAS districts.

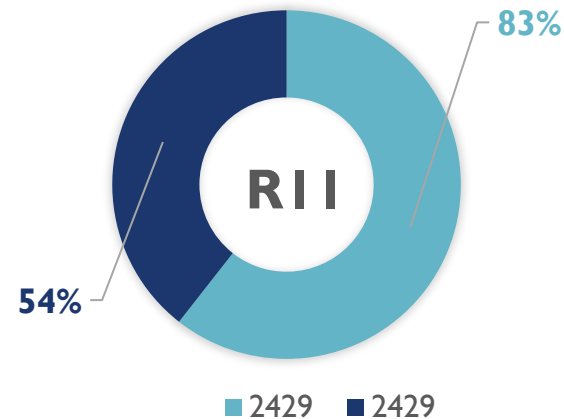
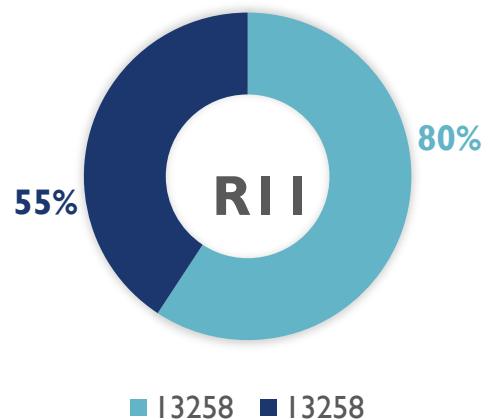
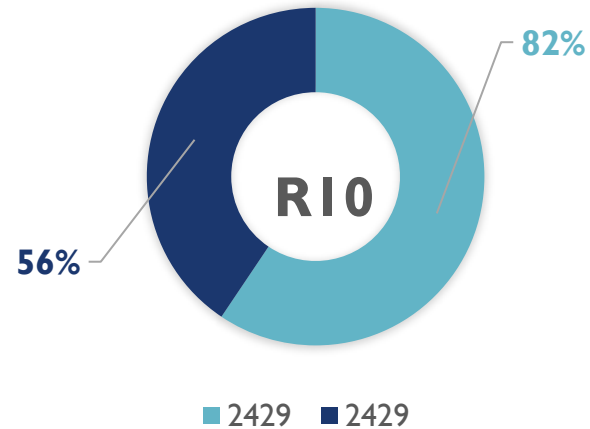
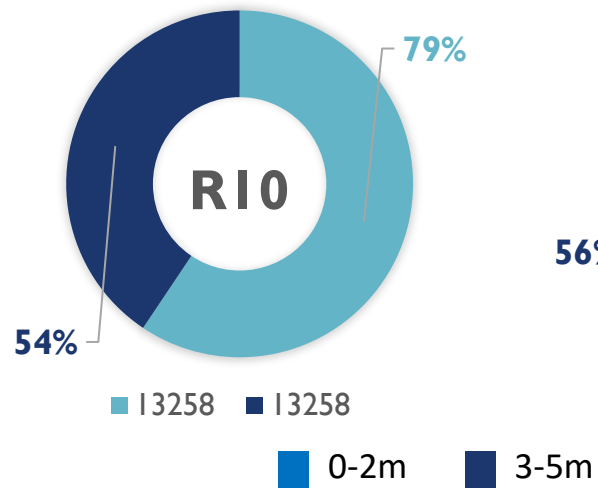
In Round 11, the proportion increased in the CAS districts and it was again significantly higher in the CAS districts. The proportion in non-CAS districts was almost similar to that of Round 10.

Proportion of mothers giving exclusive breastfeeding

Non CAS

CAS

0-5m

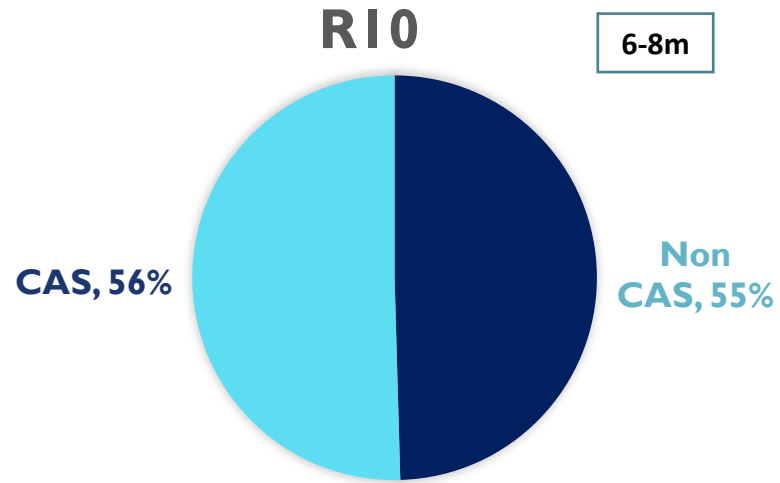


INTERPRETATION

The proportion of mothers providing exclusive breastfeeding to the children was found 82% and 56% in 0-2, 3-5 months age group in CAS districts in Round 10 while this proportion was 79% and 54% for the age group of 0-2, 3-5 months, in non-CAS districts which was slight less than the CAS districts.

In Round 11, there was an increase in the proportion of women giving exclusive breastfeeding in CAS as well as non-CAS districts in comparison to the previous year.

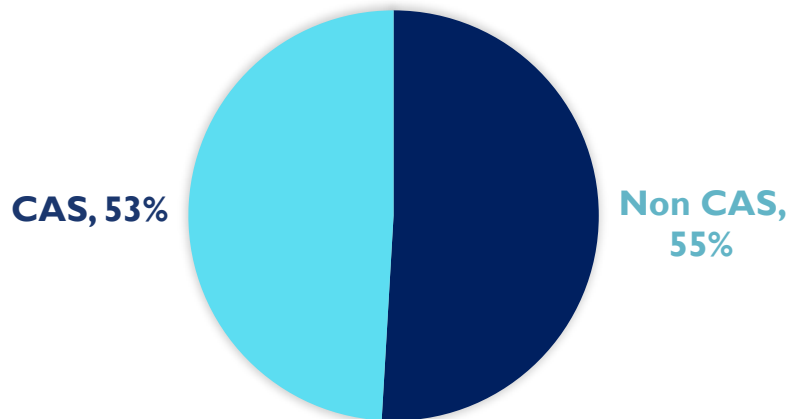
Proportion of mothers initiating complementary feeding



N

■ 13258 ■ 2429

R11



INTERPRETATION

The proportion of mothers initiating the complementary feeding in 6-8 months age group of children was almost similar (ie. 55%) in CAS and non-CAS districts in Round 10.

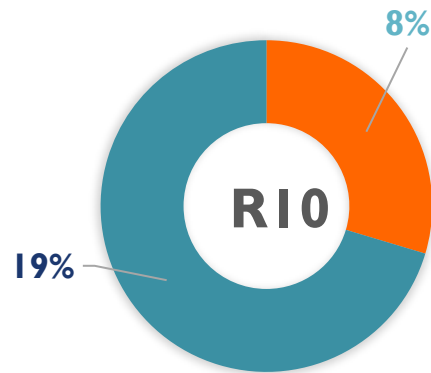
In Round 11, in the proportion in non-CAS districts was similar in comparison to the previous round. While in CAS districts, the proportion was 53%, which was slight less in comparison to the last year data as well as non-CAS districts in Round 11.

Proportion of mothers practicing dietary diversity in children

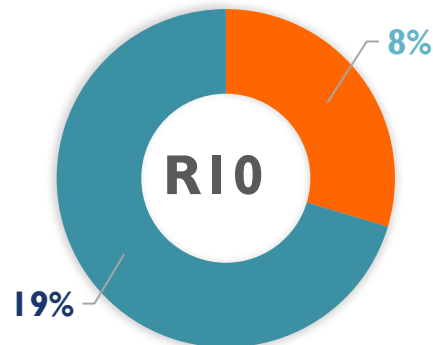
Non CAS

CAS

6-11m

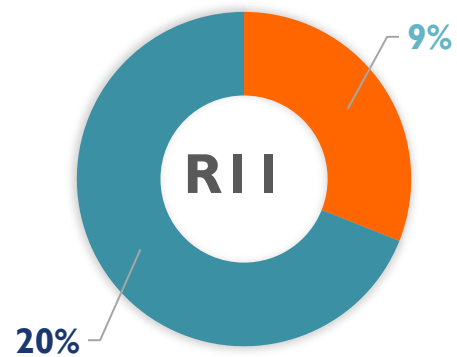


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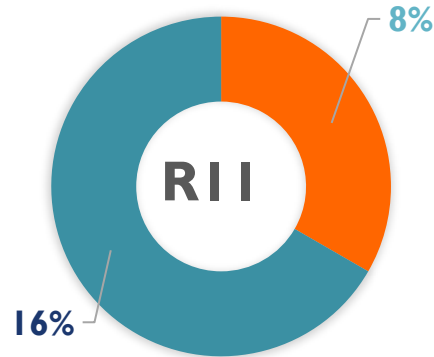


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6-8m 9-11m



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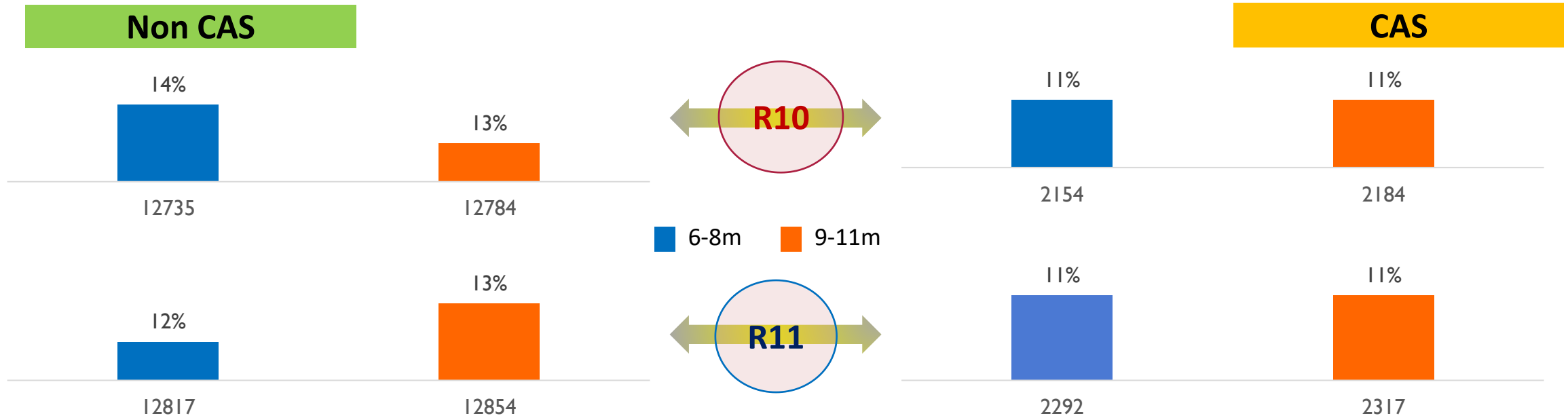
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INTERPRETATION

The data about the proportion of women practicing dietary diversity infers that the proportion of women practicing this in CAS districts was almost similar to the non-CAS districts in Round 10 in all selected age groups.

In Round 11, the proportion was slight less in CAS districts in comparison to the last year as well as in comparison to the proportion of non-CAS districts in the Round 11.

Proportion of malnourished children



INTERPRETATION

The proportion of malnourished children in Round 10 was significantly lower (11% in 6-8 m, 11% in 9-11 m) in the CAS districts comparatively in all the selected age groups of 6-11 months. (14% in 6-8 m, 13% in 9-11 m in non-CAS districts).

In Round 11, the proportion in CAS districts was again lesser (11% in 6-8 m, 11% in 9-11 m) than the non-CAS districts in all age groups of children (12% in 6-8 m, 13% in 9-11 m).

CONCLUSION

There has been a significant impact on many maternal and child health and nutrition indicators after implementation of this intervention.

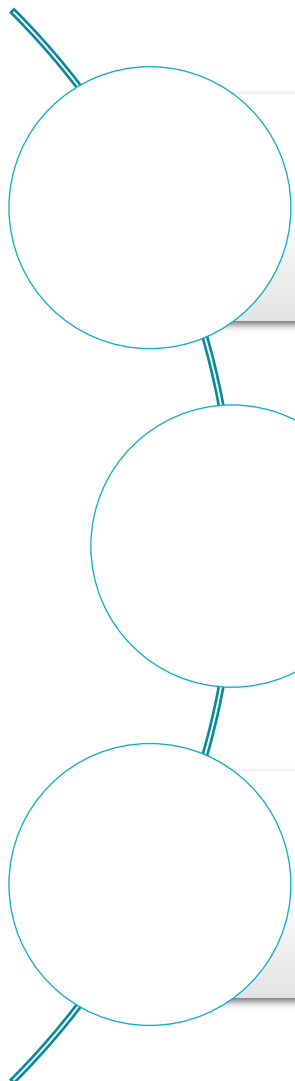


This intervention can provide a strong evidence against the improvement in mobile health technology in future.



The outcomes can help in improving the health of the mothers and children with overall improvement in the health indicators of Bihar.

SUGGESTIONS



The proportion of some indicators remained same in the CAS districts during both survey rounds, reasons could be highlighted in the study.

The reasons behind no difference in the coverage of certain indicators in CAS and non-CAS districts could also be highlighted.

No observation of increase in the co-ordination among the frontline workers in many districts which would have impacted the nutritional aspects.

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Thank You