RESEARCH BRIEF

FEEDING PRACTICES AND NUTRITIONAL STATUS OF CHILDREN IN KAKAMEGA, KENYA

Using the baseline survey of the i-PUSH (innovative partnership for universal and sustainable healthcare) study, this research brief investigates infant and young child feeding practices in Kakamega, Kenya. The brief analyses differences in quality and quantity of children's diets between different socio-economic levels and between boys and girls. Indicators signal that malnutrition is a long-term chronic issue for a large proportion of children in Kakamega. This combined with a sizable number of overweight children reflects the double burden of malnutrition and acts as a call for action to guarantee that all children receive an adequate diet.

Good feeding practices in the first two years of life are crucial for an adequate nutritional status, which reduces the risk of children getting sick and dying before reaching the age of five. Globally, more than half of the children between six months and two years do not have access to an acceptable diet, preventing them from reaching their full developmental potential [1]. Improving the nutrient intakes of children below two years old opens a window of opportunity to accumulate positive and significant long-standing effects, not only in health-related outcomes, but also in cognitive performance, educational attainment, and labour market participation [2, 3, 4, 5]. Nations must strive to improve infant and young child feeding practices in order to achieve sustainable development. By doing so, countries are contributing to the realization of (1) sustainable development goal 2.1: end hunger and ensure access by all people to safe, nutritious, and sufficient food all year round; and (2) sustainable development goal 3.2: end preventable under-5 mortality [6].

The innovative partnership for universal sustainable healthcare (i-PUSH) program, implemented by Amref Health Kenya and PharmAccess Foundation, aims to improve access to health care for low-income women of reproductive age and their family members, by providing them with subsidized health insurance on their mobile phones. In addition, Community Health Volunteers are trained using a mobile training tool to provide improved knowledge to the women about maternal and child health as well as child nutrition and hygiene. To evaluate the impact of i-PUSH on maternal and child health outcomes, the African Population and Health Research Center and the Amsterdam Institute for Global Health and Development are conducting a randomized control trial in 24 villages in Kakamega County, Kenya. In total, 233 households with a pregnant woman or an under 4-year-old child are participating in the study.

This research brief uses the baseline survey of the i-PUSH evaluation study to investigate the infant and young child feeding practices in children below twenty-four months and the nutritional status of children below four years old in the target population. Our sample contains 202 children below 4 years old, 97 under 2-year-old children, 44 under 1-year-old, and 21 under 6-month-old infants.

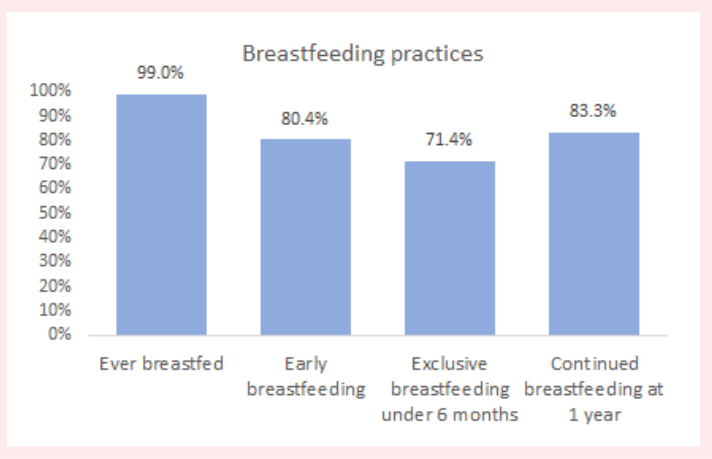
In order to provide a deep examination of the indicators, this brief also analyzes inequality between traditionally disadvantaged and advantaged groups of children in terms of sex (female/male) and wealth (terciles).

Key Points

- Poor feeding practices are an issue for a substantial number of children in Kakamega, irrespective of wealth status and sex.
- 7 out of 10 infants are exclusively breastfed in the first six months.
- Less than 2 out of 10 children between 6 and 23 months receives the minimum number of meals with the appropriate diversity of foods required to achieve optimal growth and development.
- Stark wealth- and gender-related inequalities exist for indicators measuring the quality of food children receive, like the minimum dietary diversity and minimum acceptable diet.
- Nearly 1 out of 5 children below 4 years of age are at risk of poor cognitive and motor development due to stunting.

Breast-feeding indicators

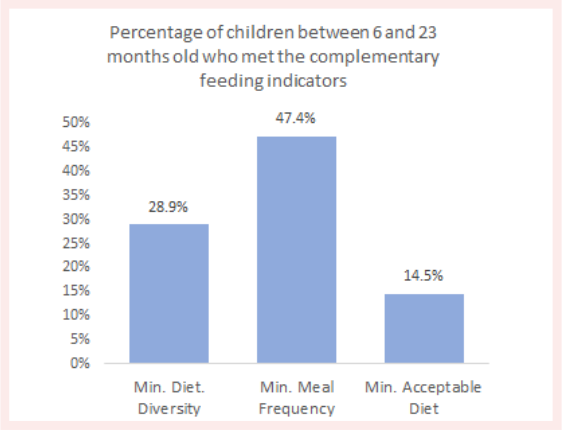
The World Health Organization (WHO) recommends infants are breastfed within the first hour after birth and exclusively during the first 6 months [7, 8]. Virtually all infants born in the last 24 months in Kakamega were ever breastfed (99%) and 8 out 10 were breastfed within the first hour after birth. This corresponds well with the WHO statements on breastfeeding practices. Early breastfeeding in Kakamega is 50.3 percentage points (pp) above the average reported for the county in the last Multiple Indicator Cluster Survey of 2013/14 (MICS) (30.1%). Exclusive breastfeeding among under 6-month-old infants is 71.4% and continued breastfeeding at 1 year is 83.3%, compared to the Kakamega averages of 34.7% and 74.7%, respectively, reported in the last MICS [9].



Complementary feeding indicators

From 6 months onward, infants need to be introduced gradually to complementary foods and liquids (other than breast milk) in order to meet their nutritional requirements and achieve optimal motor and cognitive development [11, 12]. From that moment, up until two years of age, children are most likely to become malnourished as a consequence of inadequate complementary feeding practices, increasing their risk of getting sick and dying, not only during this period but also later in adulthood [13, 16]. The WHO recommends the measurement of complementary feeding indicators in this period in order to assess infant and young child feeding practices [7]. The graph to the right shows the percentage of children who met the complementary feeding indicators. Nearly half met a Minimum Meal Frequency (47.4%) and only 28.9% met a Minimum Dietary Diversity. Compared to the last MICS, fewer children in our sample met these indicators ($p<0.05$) [9].

The Minimum Acceptable Diet indicator provides a measurement of both, quantity and quality of food received. In our sample, 14.5% of children met this indicator, which is close to the value reported in MICS (19.9%) [9].



This brief focuses on three core indicators:

- Minimum meal frequency: Proportion of children between 6 and 23 months who receive solid, semi-solid, or soft foods the minimum number of times or more during the previous day.
- Minimum dietary diversity: Proportion of children between 6 and 23 months who receive foods containing at least 4 or more food groups during the previous day (for example: roots, dairy products, eggs, and flesh meat).
- Minimum acceptable diet: Proportion of children between 6 and 23 months who receive a minimum acceptable diet (apart from breast milk if child is still breastfed) during the previous day.

Ideally, all children between 6 and 23 months should meet these indicators.

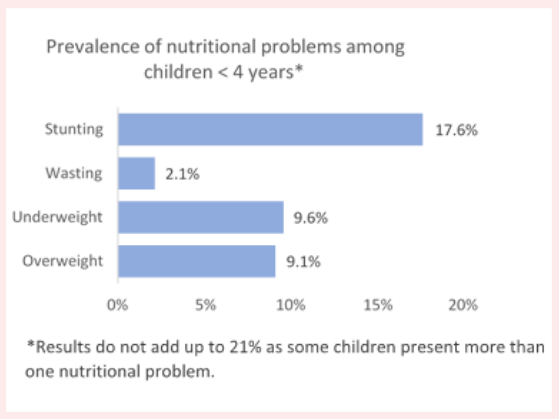
Anthropometrics

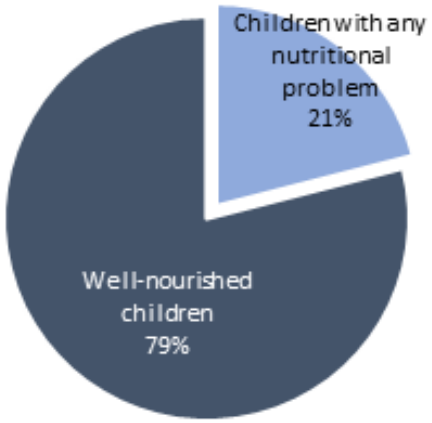
In order to determine the nutritional status of children up to 4 years old, anthropometric indicators were built following the current recommendations [15,16]. To do so, measures of weight and length/height were obtained during the i-PUSH baseline survey. The evaluated indicators included length/height relative to age, weight relative to age and weight relative to height. Z-scores were calculated to describe how far and in what direction each child's measure was from the mean of the World Health Organization Child Growth Standards. Z-score values outside the normal range (-2 to +2) indicate a specific nutritional problem or condition: stunting, wasting, underweight or overweight.

Our findings show that 1 out of 5 children below 4 years old presents a nutritional problem. Stunting is the most prevalent condition, affecting 17.6% of children under 4. Despite its high prevalence, it is lower than the national average of 26.7% reported in the last Demographic and Health Survey (DHS) ($p<0.05$) [10]. On the other hand, the prevalence of overweight (9.1%) is high compared to national levels (4.7%) ($p<0.05$) [10]. Underweight (9.6%) and wasting (2.1%) are similar to the national levels (10.7% and 4.12%, respectively). It is important to notice that children may present these conditions concomitantly. For example, of the children who are stunted 32.3% are underweight, but 16.1% are currently overweight.

Condition	Implications	Anthropom. Indicator	Values
Stunting	Chronic undernutrition; increases risk of poor cognitive and motor development and death	Length/ height relative to age	Low, < -2 z-score
Wasting	Caused by quick weight loss or deficient weight gain; associated with higher mortality	Weight relative to length/ height	Low, < -2 z-score
Under-weight	It can indicate stunting and/or wasting	Weight relative to age	Low, < -2 z-score
Over-weight	It indicates high levels of body fat and increases the risk of NCD	Weight relative to length/ height	High, > + 2 z-score

NCD=Non-communicable diseases





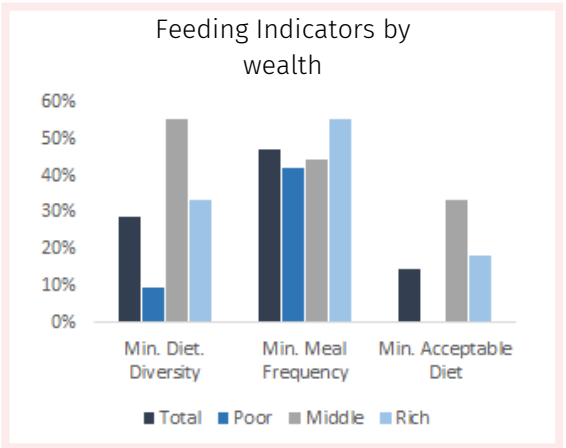
Inequalities

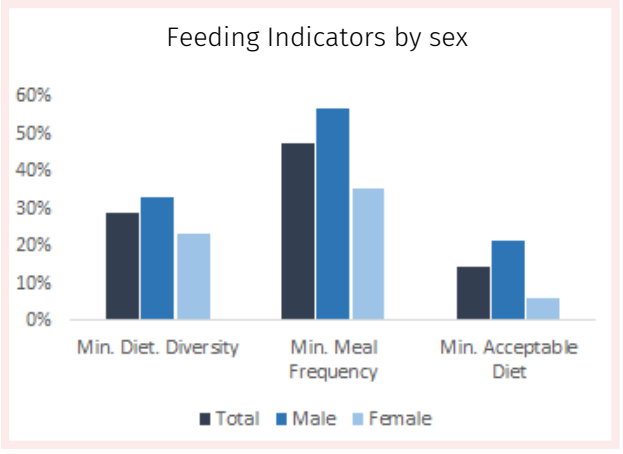
In order to provide a deeper examination of nutritional practices and nutrition status, we analysed wealth- and sex-related inequalities.

With the aim of exploring wealth-related inequalities, a wealth index was calculated using data on household's ownership of selected assets, following the DHS Program recommendations [14]. Subsequently, households in the sample were ranked by wealth index and equally distributed in wealth terciles (poor, middle, and rich). This is a relative measure of wealth, which means that households and individuals in the third tercile are relatively rich compared to the rest of the sample, but not necessarily rich in an absolute sense.

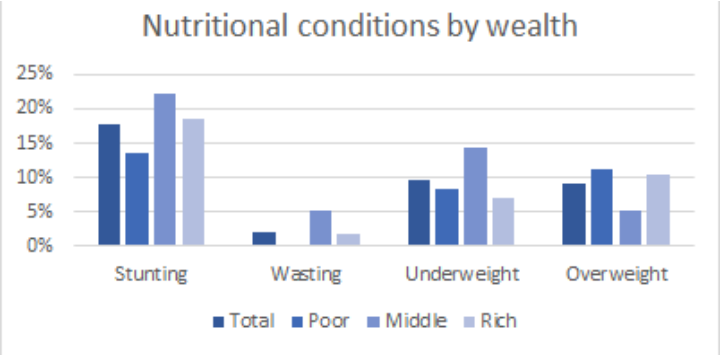
Children below 4 years in our sample (n=202) are equally divided over the wealth terciles and 109 are males and 93 are females. Regarding children below 24 months (n=97), 54 are males, 43 are females, 38 are in the first or poorest tercile, 25 are in the second or middle tercile, and 34 are in the third or richest tercile. We emphasize that wealth terciles are relative. These are all low income households.

No differences across wealth and sex were found in exclusive breastfeeding under 6 months, early breastfeeding, and the percentage of children ever breastfed. However, the proportion of children between 12 and 15 months who are still breastfed is significantly higher among the poorest (100%), compared to the middle and richest terciles (66.7% and 77.8%, respectively) ($p<0.05$). This difference across terciles in continued breastfeeding at 1 year must be cautiously interpreted as the number of children in the pertinent age group is small (n=24) resulting in less than 10 children in each tercile.



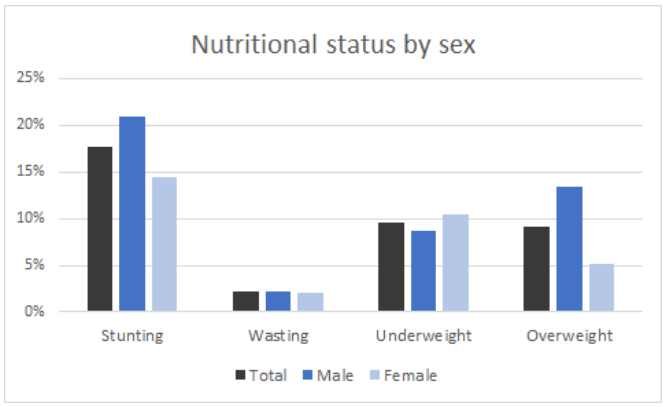


Inequality between the poorest tercile with respect to the middle and richest terciles is significant for Minimum Dietary Diversity and Minimum Acceptable Diet ($p<0.05$). Only 1 out of 10 poor infants met the Minimum Dietary Diversity, compared to at least 4 out of 10 children in the middle and rich terciles. Moreover, none of the children in the poorest tercile received a Minimum Acceptable Diet, compared to 33% and 19% of the children in the middle and richest terciles. Minimum Meal Frequency is similar across



tercile, which reflects that the main wealth-related gap is referencing quality, rather than quantity, of food received.

Disparities are observed across sex, as well. Female children get less diverse foods and a lower meal frequency than males. This leads to a significant difference across sex in Minimum Acceptable Diet: only 6% of female infants met the indicator, compared to 21% of males ($p<0.05$). Regarding anthropometric indicators, children in the poorest tercile have a lower likelihood of being stunted or wasted. Although this finding is statistically significant only for wasting ($p<0.05$), it is relevant as it may suggest differences in child mortality rates across wealth terciles, meaning that we observe (more) children from the middle and rich tercile who are stunted or wasted.



because they have the sufficient means to overcome or survive conditions of malnutrition. On the other hand, overweight seems to be more prevalent among poor children ($p>0.05$). Across sex, only the prevalence of overweight is higher among males than females: 13.3% compared to 5.1%, respectively ($p<0.10$).

Conclusion

Breastfeeding practices among infants below 6 months in Kakamega appear very well aligned with WHO guidelines. On the other hand, complementary feeding indicators show a relatively poor performance especially among the poorest children and girls. The anthropometric indicators signal that malnutrition is a long-term chronic issue for a large proportion of children in Kakamega. This combined with the high level of overweight reflects the double burden of malnutrition and calls for action to guarantee that all children receive an adequate diet in quantity as well as quality.

Despite the fact that the government of Kenya has a well-defined National Nutrition Action Plan which is supported by a National Strategy for Maternal Infant and Young Child Nutrition associated with different programs to enhance infant and young child feeding practices, targeting the most disadvantaged groups is still a challenge that needs to be continuously addressed with a gender and equity perspective.

The main goal of i-PUSH is to improve access to health care for low-income women of reproductive age and their family members. i-PUSH has the ability to stimulate the uptake of good infant and young child feeding practices and improve the nutritional status of children through two mechanisms. First, it is anticipated that, by eliminating/reducing the out-of-pocket healthcare expenditures, there will be a larger amount of money available for other resources, like food. Second, the healthcare finance mechanism and digital tools are expected to increase access to healthcare services and trained community health workers, thereby enhancing mother's knowledge of good feeding practices.

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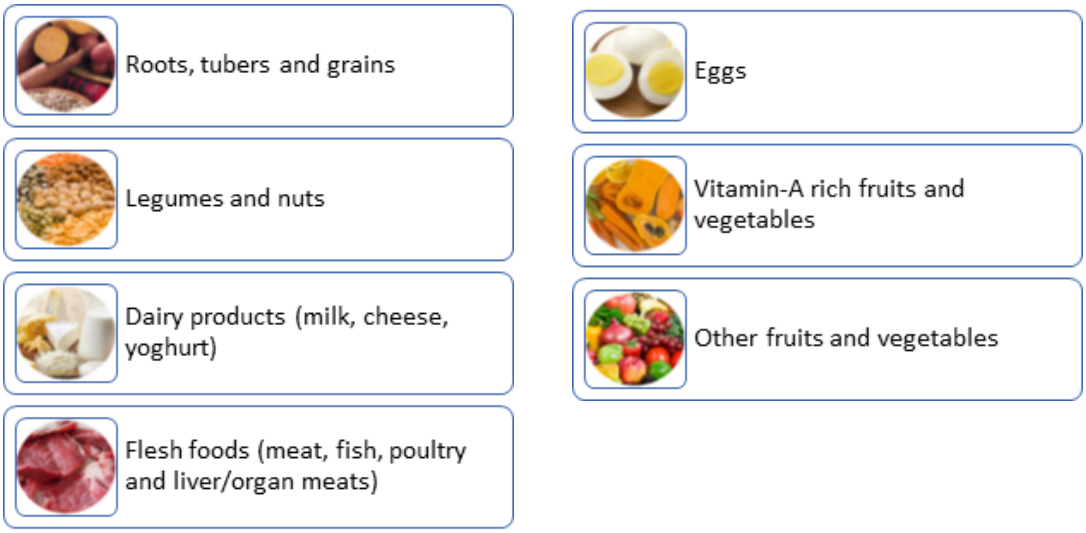
Appendix

I. Detailed definitions of feeding practices indicators

Feeding practice	Definition	Requires Infant Receive	Age Group
Early breastfeeding	Proportion of children who were put to the breast within one hour of birth.	Breast milk within one hour of birth	0 – 23 months
Exclusive breastfeeding	Proportion of infants who are fed exclusively with breast milk.	Breast milk during the previous day	0 – 5 months
Continued breastfeeding	Proportion of children who are fed breast milk.	Breast milk during the previous day	12 – 15 months
Child ever breastfed	Proportion of infants who were ever breastfed	Breast milk	0-23 months
Minimum dietary diversity	Proportion of children who receive foods from 4 or more food groups.	At least 4 food groups during the previous day	6-23 months
Minimum meal frequency	Proportion of children who receive solid, semi-solid, or soft foods the minimum number of times or more.	6-8 months: at least 2 solid, semi-solid or soft foods. 9-23 months: at least 3 solid, semi-solid or soft foods if breastfed, or 4 if not breastfed during the previous day	
Minimum acceptable diet	Proportion of children who receive a minimum acceptable diet (apart from breast milk).	6-8 months: at least 2 solid, semi-solid or soft foods with 4 food groups. 9-23 months: at least 3 (4) solid, semi-solid or soft foods if breastfed (not breastfed) with 4 food groups. During the previous day	

II. Food groups included in the construction of the infant and young child feeding practices indicators



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