Preventing malnutrition among children below 2 years in Chad – Non-randomized intervention study comparing seasonal versus perennial distribution of ready-to-use supplementary food

France Broillet

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Background

- Food insecurity and malnutrition are major public health concerns in the Sahel band at Lake Chad.

- Recurrent environmental crises –such as drought, floods and insect infestations– deteriorate the situation especially during the hunger gap period.

- Effect of RUSF well established however information on optimal distribution schemed is scarce.

- Setting: 3 zones in the Massakory district, Chad.

- Aim: To evaluate the effect of Ready-to-Use Supplementary Food (RUSF) on nutritional status, growth and health on children 6-24 mo.

Program details

- Intervention: supply of RUSF at distribution sites in exchange of a voucher
  - In **Zone 1 & 3** mothers received vouchers for whole year round monthly supply (**12 months**)
 - In **Zone 2** vouchers for **4 months** between June to September (hunger gap period)

- Outcomes:
  - MUAC <115mm and MUAC <125mm
  - Mortality
 - Compliance
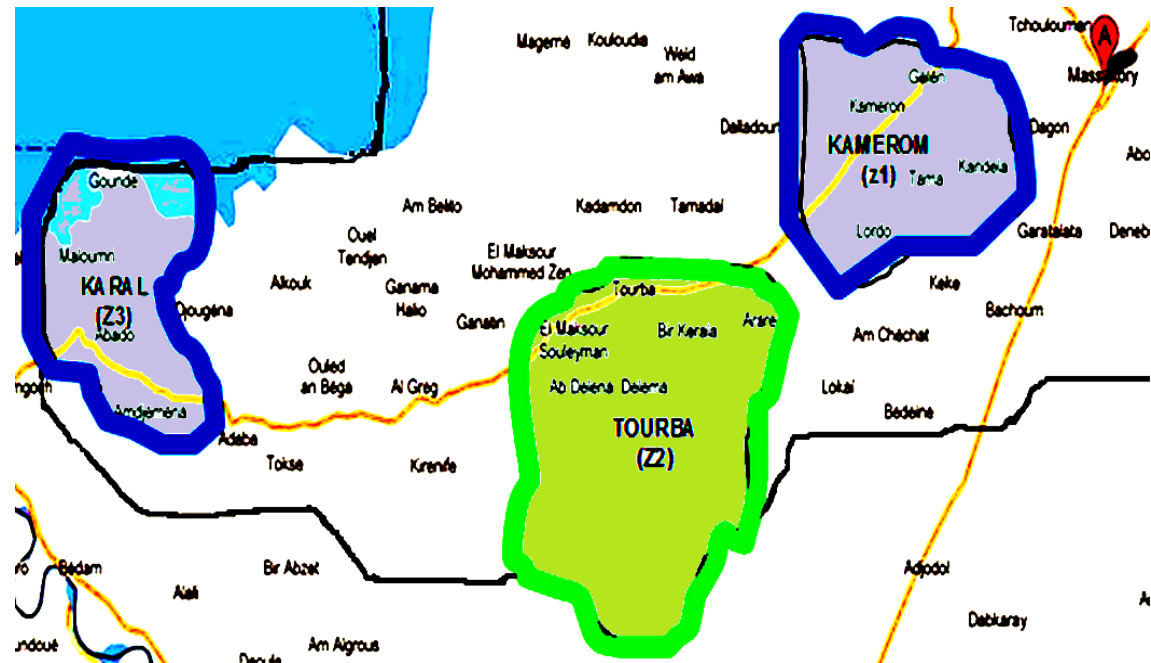
Part 1:RUSF vs no-RUSF - Methods

Method

- 60 villages in the intervention area have been matched to 30 villages outside.
  - Propensity score matching on village size and geographical proximity.
- Within village-triples children pair matched on height
- Assessment at end of hunger gap
  - Sep 2012
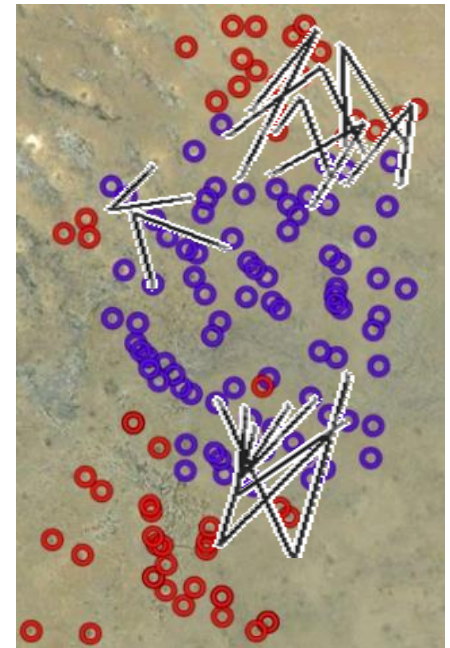
Part 1: RUSF vs no-RUSF- Results

- 507 children within the RUSF intervention arm
- 507 children with no intervention (outside)

Parameter	RUSF	no-RUSF	OR	P
MUAC <115	1.2%	3.7%	2.9	0.03
MUAC < 125	11.8%	19.1%	1.7	0.01
WHZ < -3	3.7%	5.1%	1.4	0.28
WHZ < -2	19.9%	19.7%	1.0	0.93

Odds ratio 95% CI

0.5   1.0   2.0   5.0
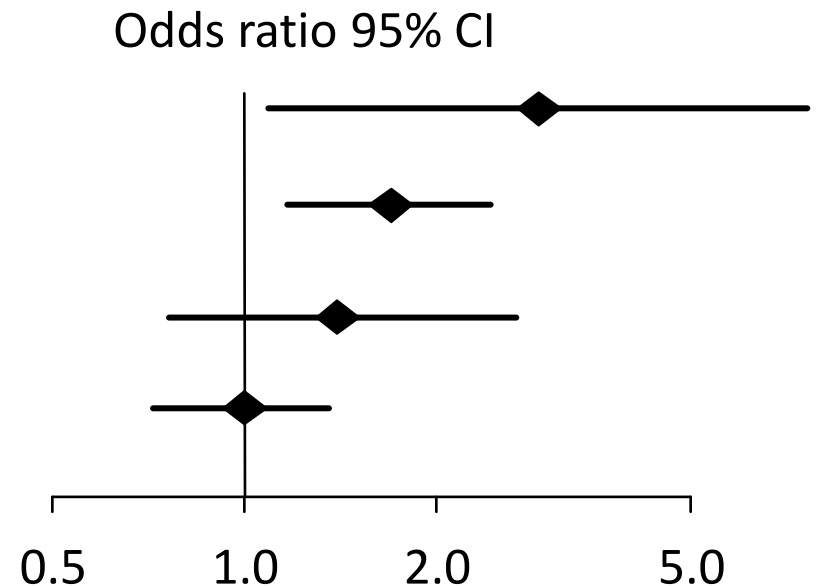
Part 2: 4 vs 12 months RUSF- Methods

- Continuous enrolment of all children 6 to 24 months registered for the RUSF distribution in the 3 zones from March 2012 to March 2013
  - 3501 children enrolled in March 2012 , 929 afterwards
- Monthly measurement of MUAC
- 3 monthly measurement of weight and height
- Child and household level questionnaire

Part 2: 4 vs 12 months RUSF – Baseline characteristics

Child characteristics %	12 mo RUSF	4 mo RUSF
n children	2661	1766
height (mean)	70.7	70.9
age 6-11mon	52	49
age 12-17mon	24	25
age 18-24mon	24	27
sex female	51	48
Anthropometrics %		
MUAC < 115	2.5	1.1
MUAC < 125	15.5	9.2
WHZ < -3	3.4	2.6
WHZ < -2	15.1	12.3
Househ. socio-demo %		
n households	2338	1645
hh members (mean)	6	6
Arab	41	24
High vulnerability	31	39
Co-spouse	26	29
Own Moto	30	14

Difference %-points

-20.0   0.0   20.0
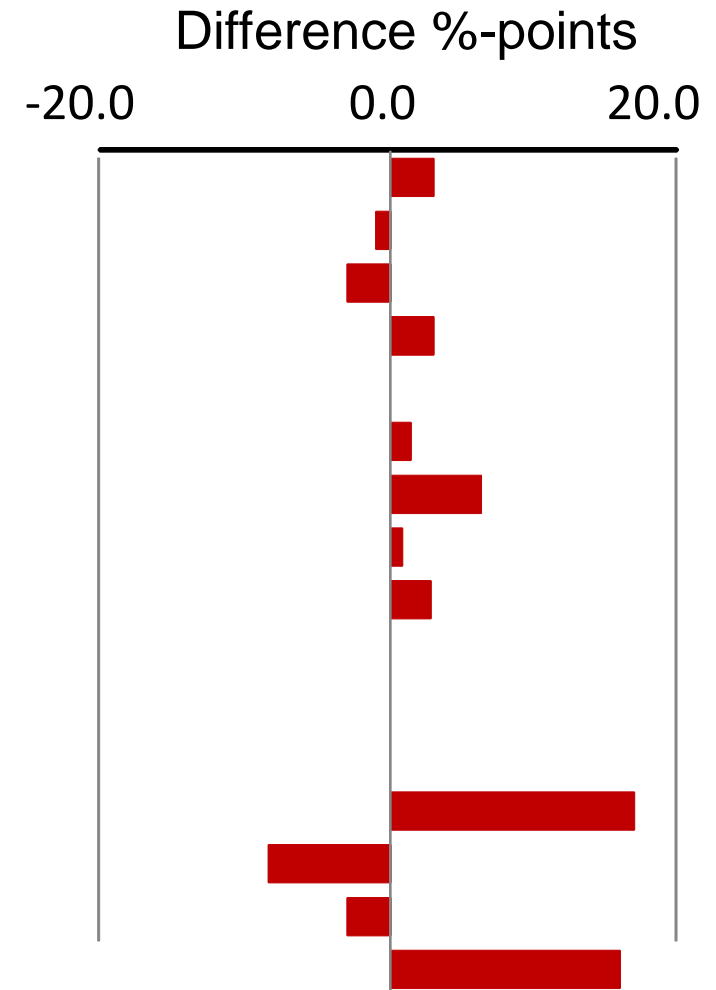
Part 2: 4 vs 12 months RUSF- Main results

- Statistical analysis – Incidence rates (1000 *child-years*)

Incidence rate ratio 95% CI

Parameter	12 m RUSF	4 m RUSF	IRR	P
MUAC <115	138	91	1.5	0.007
adjusted			1.5	0.02
MUAC < 125	628	508	1.7	0.005
adjusted			1.3	0.01

0.5   1.0   2.0   5.0

Subgroup	12 m RUSF	4 m RUSF	IRR	P
Well nutr. BL	71	59	1.3	0.16
Compliant	136	82	1.5	0.007
Arab	119	86	1.5	0.2
Kanembu	157	92	1.7	0.005

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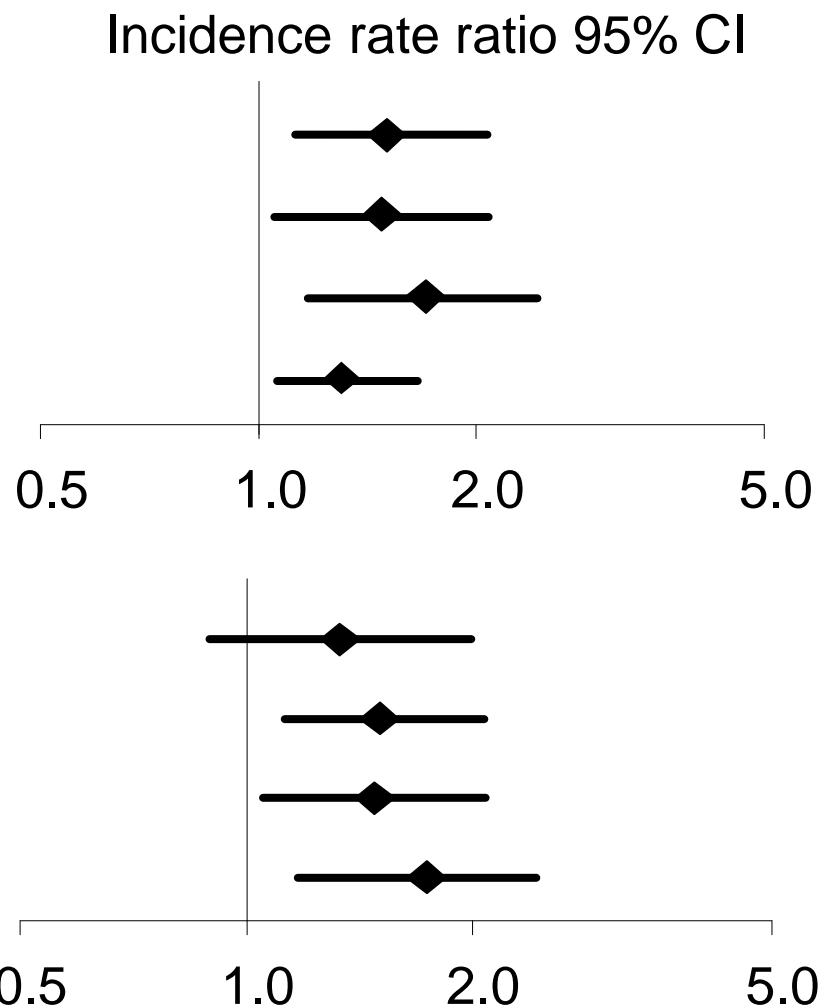
Part 2: 4 vs 12 months RUSF- Other findings

- Mortality: No difference between intervention groups
    - 12m RUSF: 28. 2 per 1000 child at risk
    - 4 m RUSF : 26.7 per 1000 child at risk

- Compliance was high (>80%)

- Compliant households did not differ from non-compliers in socio-economics & anthropometrics

- The intervention was similar well received in all ethnic groups.

- Clear dose-response relationship: n vouchers & prob. of malnutrition

- But causality not entirely clear

Vouchers per month

n exchanged vouchers
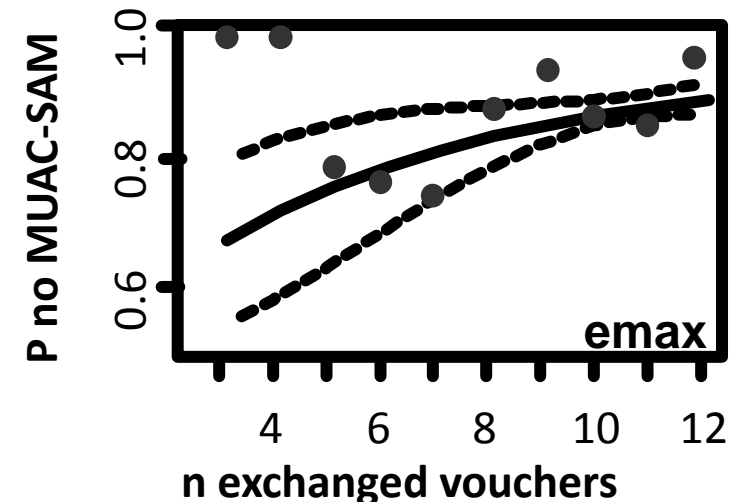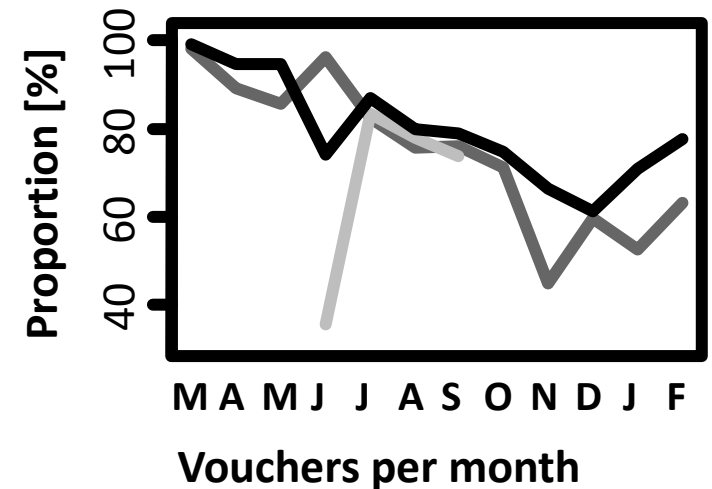
Conclusions & recommendations

- No evidence that 4 months supply during hunger gap is less effective compared to whole year supply.
  - But causal interpretation difficult
    - Study groups differed in several baseline characteristics
    - Not randomized, not blinded (ethical reasons)
    - Higher loss of follow-up in one zone
- Impact of RUSF is apparently higher during the hunger gap season (data not shown).
- High acceptability and compliance to RUSF distribution.

- Final recommendations difficult to be drawn without second year analysis, however RUSF distribution during hunger gap period should be considered as part of nutrition intervention in context with seasonal malnutrition peak.

Discussion points

- In context of high seasonal malnutrition peak nutrition intervention should include preventive activities with RUSF.

- Need to harmonise measurements and to improve data quality.

  - As unifying definition of time at risk (incl missing data)