Result. Samples with 25% potassium-enrichment were indistinguishable from regular table salt, whereas samples with 33% and 50% were distinguishable.

Salt Substitute Combination for Intervention:

25% KCl - 75% NaCl
Qualitative study (1)

- In-depth interviews and focus groups, 6 villages.
- 170 focus group participants (including men and women), 18-65 y/o
- 66 in-depth interviews: 35 people with hypertension, 17 local authorities, 8 traders, and 6 health personnel.
Women are the family cooks but men’s opinions about food quality and taste also influence the women’s choices.

Salt is considered a key ingredient for food flavor. Even though a high consumption of salt is considered unhealthy, there is no association between salt intake and hypertension.

Available table salt is very cheap (USD 0.20/kg) and has very low quality (grey color). Salt substitute is not available in the area and participants in focus groups showed high interest in using it.
Qualitative study (3), other

- Low influence of health system and health workers in community members behaviors

- High recognition and credibility of community health promoters of Centro de Salud Global, our local partner in Tumbes

- Low penetration of radio and newspapers in small villages

- Community spaces and activities identified
Product Identity Research (1)

- **Product (substitute):**
  - Creation of substitute identity: name and colors of the product, including selection of packaging and size of the bags (1 kg)
Product Identity Research (2)

- Short questionnaire with 60 participants (10 per village) to build product identity
  - Name: Liz
  - Character: Similar to local women
  - Packaging
    - Transparent plastic bags, red and orange colors, including product information. 1 Kg. weight.
    - Salt container: Plastic, screw cap, 1 Kg. capacity.
Again context!
Implementation phase
Stepped wedge trial

Villages (clusters)

Time (in periods)

April-July 2014 enrollment and baseline data collection in the 6 villages.

2365 adults of 2575 potential participants accepted to be enrolled (92%). Rejection rate was 4.9% (N=127).

July 2014: Random selection of the 1st village for intervention
August 2014: Implementation phase began
March 2015: Two villages receiving the intervention
Production of salt substitute

- Salt substitute with 25% KCl is not available in the market.

- A small factory has been built in Tumbes to produce the salt substitute. The ingredients are “imported” from Lima.
Distribution

- Price: Free
- Market: ~ 1200 families of 6 villages, 7 restaurants, 2 bakeries and 2 local sellers.
- Exchange of all table salt for salt substitute.
- Free delivery, approximately once per month
- First delivery arrives in plastic pots
Target groups: Women (family cooks) & Community members.

Main strategies: Liz’s friends (sellers or promoters), door to door and edutainment (educational entertainment) to promote the consumption of Sal Liz.
Social Marketing Campaign (2)

Campaign outline

Activities for women
- door to door promotion
- activities outdoor
- promotional materials

Activities for the whole community
- outdoor games
- advertising outdoor
Summary. Why all this?

- Main outcome
  - Difference ($\theta$) 3 mm Hg in blood pressure levels, intervention and control groups

- Population-based approach

- Ask Darwin for his slides 😊
Municipal bakery

- A few days in Peru
- After your food tour yesterday
- ...?
- Processed foods?
Are sources of sodium intake the same?

USA
11.5g/persn/day

Developed countries
>75% Na

Processed foods

Restaurants

Peru
No data

One Municipal bakery: 0.5g salt /bread unit
Bread makers

Do worry about…
- Texture
- Shape
- Crunchy-ness
- Sales

- Preparation 20g salt / Kg flower

- What would you change?
- Again, think about the other.
TTT bread preparation, n=70 customers
Results

- Bread prepared with 18g salt/kg flower
  - 39% (27 people) detected the odd sample
  - 56% found differences in salted flavour
  - 80% will continue buying in the bakery

- Bread prepared with 16g salt/kg flower
  - Only 27% (19 people) detected the odd sample
  - 45% found differences in salted flavour
  - 84% will continue buying in the bakery

- No difference
- Let’s do it! Bread prepared 16g salt/kg flower
Intervention

Bread prepared with 20g $\rightarrow$ 16g salt / kg flower
20% reduction

3 months, Pan Francés only, one bakery

**Constant:**
- Estacionalidad
- Price
- Bakers
- Any other promotion
Results

- Similar annual trend observed
- No difference after introducing bread prepared with lower salt

Junio 2013: remodelación de la panadería.
Conclusions

- Feasible
- Not rejected by customers
- Sales not affected
- Sustained
- Immediate KT
- Waiting for larger battles
Original Paper

Design and Multi-Country Validation of Text Messages for an mHealth Intervention for Primary Prevention of Progression to Hypertension in Latin America

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On the go… 2 by 1… 25 by 25?

- Municipal bakery
  - We succeed!
  - Now, waiting for political moment to scale

- mHealth to prevent progression from prehypertension to hypertension
  - Four domains, one of them reduce salt
  - We failed! As Researchers. Remember about dosage and fidelity
  - We succeed, in opening new areas of intervention
Closing remarks

- Be curious, do not assume we know everything

- Complex interventions required being aware ahead of time

- Challenges in development, but use those developments to do other things

- Define well ahead of time your process / uptake / fidelity indicators
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Manuscripts


Challenges (1)

- The ethical approval process for the intervention activities was difficult, particularly because we needed to coordinate two committees:
  - As the suggestion of one of the IRBs, we decided to split our original proposal into two smaller projects
- Difficulty in the implementation of a huge intervention:
  - To find an appropriate way to accomplish our objectives: we can guarantee substitute delivery but not consumption
  - Salt logistics: buying, mixing, packaging, delivery strategies, inventory, storage, appropriate personnel
Challenges (2)

- Marketing campaign: two “different languages” (research and communication) trying to build a common product:
  - Multiple meetings (weekly) with the marketing team to create an appropriate campaign
  - In some cases, we lacked evidence to support proposed strategies: needed validation and a pilot of the marketing strategy
  - The campaign has been built in the best way possible, but there is a plan B in case of failure
Aim 1: Marketing campaign

Logistic Team

- Substitute creation (mixed)
- Deliver substitute to families
- Enable delivery points

Communication and Education Team

- Support food preparation (home visits, recipe delivery, incentives, etc.)
- Family groups (briefings, food preparation, incentives, etc.)
- Village and community level (product release: fairs, substitute tasting, etc.)

Intervention at three levels