National scale-up from RCT results: Using multiple impact evaluations to inform national implementation

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Literacy Programs in Kenya

- **PRIMR** – 2011-2015
  - 1384 schools
  - 250,000 children
  - Through GoK personnel
  - Medium scale pilot

- **Tusome** – 2015-2019
  - All 23,800 schools
  - 6.4 million children
  - 23.5 million books
  - 101,000 teachers in July 17
  - GPE numeracy scale-up

Thomas Guskey change model

Training ⟶ Understanding ⟶ Change

Old model

Training —80%→ Understanding —40%→ Trying —15%→ Evaluating —5%→ Change
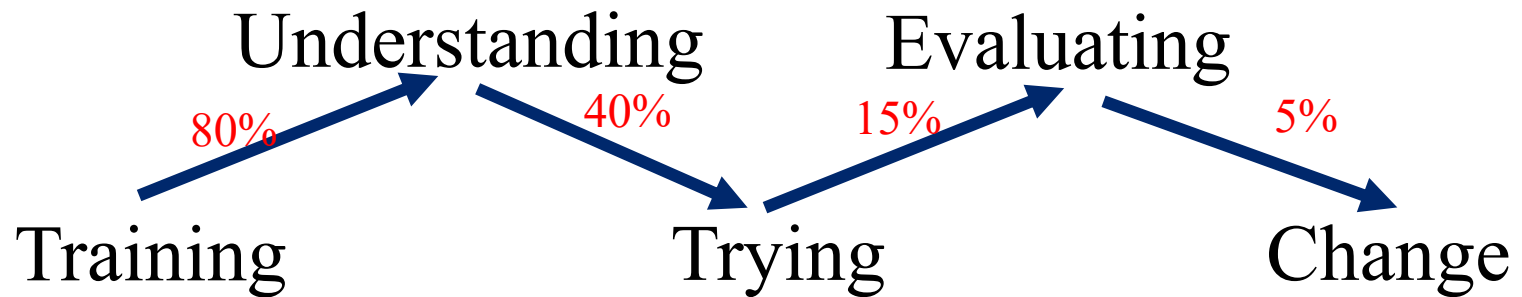
Guskey model

Literacy and Numeracy RCT studies in Kenya

RCT Studies	Subjects	Did it Work?
PRIMR midterm (Piper, Zuilkowski & Mugenda, 2014)	English, Kiswahili	Yes
PRIMR endline (Piper, Jepkemei & Kibukho, 2015)	English, Kiswahili	Yes
PRIMR endline (Piper, Ralaingita, Akach & King, 2016)	Mathematics	Yes
PRIMR Coaches 10:1 or 15:1 (Piper & Zuilkowski, 2015)	Eng, Kisw, Math	Mostly
PRIMR Coach visits (Piper & Zuilkowski, 2015)	Eng, Kisw, Math	No
E-reader, tch tablet, coach tablet (Piper, Jepkemei, Kwayumba & Kibukhko, 2015)	English, Kiswahili	Mostly
Mother tongue (Piper, Zuilkowski & Ong'ele, 2016)	2 mother tongues	Mostly
Mother tongue on other subjects	Eng, Kisw, Math	No
Training vs. Training+Books vs. Training/Books+Teachers' Guide	English, Kiswahili, Math	Some Did

lake	Mike
face	rice

words.

cold   say

e story.

and the ape

race to the l...
ere is a huge ape
s face too.

Kate and the ape

● sh o p   f i sh   ch o p

shop   fish   chop

Prac... ...eading the common words.

▲   have   say

Look a... ...picture. Read the story.

...Sam w...

...rice. Moth...
...er the t...
...lf. Th...
...The...
...e rice.

...rice.

Coach Ratio RCT

Randomly assigned coaches

- 10:1 outperformed 15:1
- 15:1 more cost-effective
- Nonformal schools issues

Coach visits

- No random assignment
- Didn't work well
- Similarity of findings

Key: Experimental vs. non-experimental results

ICT RCT – Comparing 3 levels:
pupil e-reader, teacher tablet, coach tablet

- E-reader costs are high

- 2 zones of 10 schools

- Rural and peri-urban

- 0.2 to 0.6 SD effect size

- Cost-effectiveness as well

- Needed a base treatment

- Underpowered for treatment group comparisons

Key: Power issues for comparing treatments

am June.
am the sixth month of the year.
I go up to 30 days.
rmers get a lot of food when I come.
thers have a lot of food to
ok too.

June

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

10

July

M	T	W	T	F	S	S
	1	2	3	4	5	
	8	9	10	11	12	
	15	16	17	18	19	
	22	23	24	25	26	
27	28	29	30	31		

My name is July.
I am the seventh month of the year.
I go up to 31 days.
People feel cold when I come.
They put on heavy clothes.
The clothes help them to keep warm.

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Ingredients Comparison

- What are the ingredients?
- Training & Support
- Training & Support + Books
- Training & Support & Books + Training Guides
- Relevant question
- Large effects: 0.4 to 1.3 SD
- Cost-effective interventions
- Needs much more qualitative research

Key: Cost-effectiveness

National Tusome Early Literacy Programme

Pilot Compared with National Scale

Metric	PRIMR PILOT	TUSOME SCALE	Factor
Funding	15.7 million	73.8 million	4.7
Teachers	2800	76,000	27.1
Head teachers	1384	23,800	17.2
Coaches	70	1270	18.1
Pupils (yearly)	110,000	3.6 million	32.7
Books	340,000	23.5 million	69.1

Coaches using tablets

Tusome Data Dashboard

Tusome classroom observation dashboard

National Data

TUSOME

Year 2017 ▾ Month Jun ▾

| CSO | SCDE | ESQAC | MATHS |

CSO Report (2017 Jun)

Counties

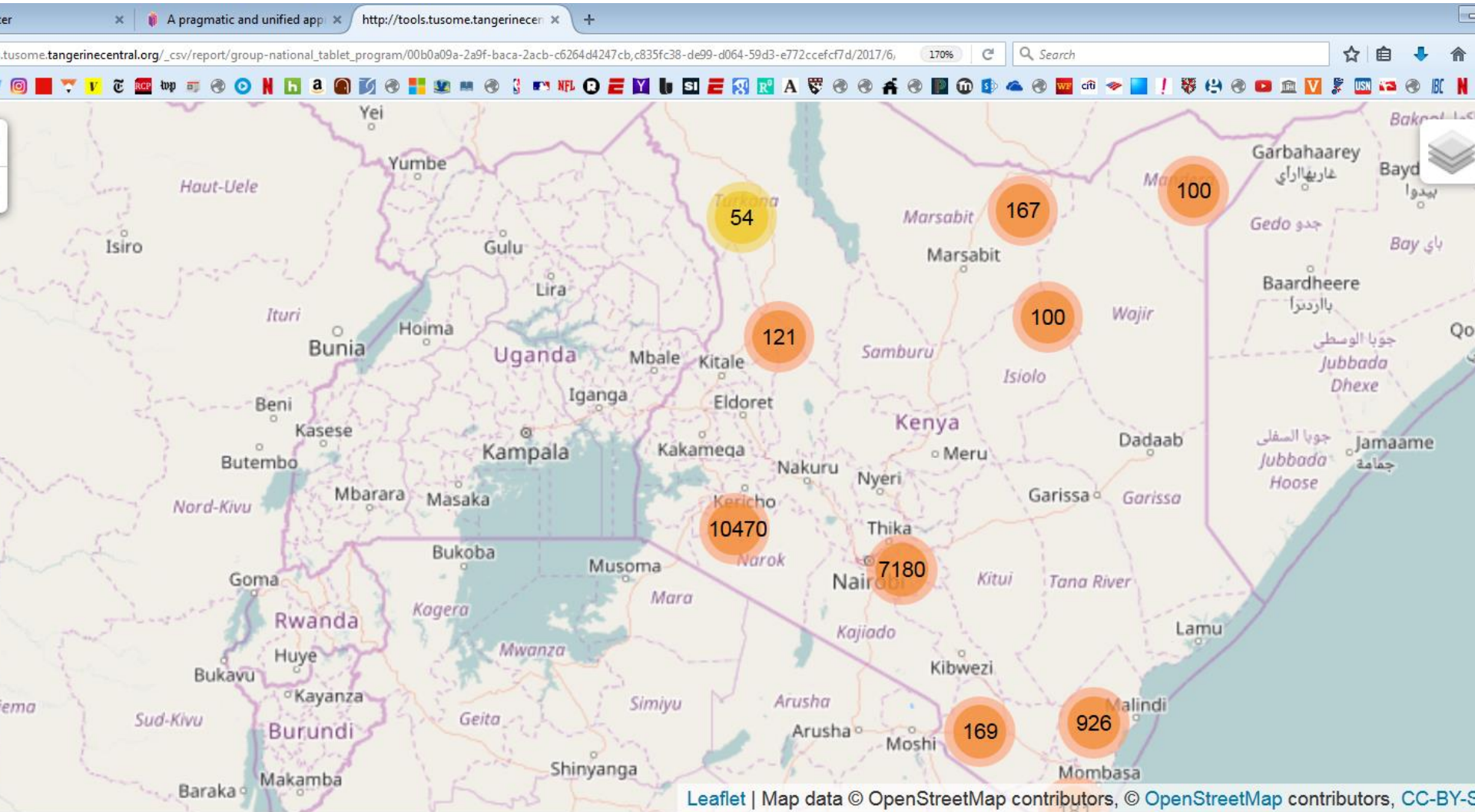| County	Number of classroom visits[1] (Percentage of Target Visits)	English - Class 1 Correct per minute[3] (Percentage at KNEC benchmark[4])	English - Class 2 Correct per minute[3] (Percentage at KNEC benchmark[4])	English - Class 3 Correct per minute[3] (Percentage at KNEC benchmark[4])	Kiswahili - Class 1 Correct per minute[3] (Percentage at KNEC benchmark[4])	Kiswahili - Class 2 Correct per minute[3] (Percentage at KNEC benchmark[4])	Kiswahili - Cla Correct per min (Percentage at K benchmark[4
All	20281 (82%)	20 (36%)	39 (39%)	59 (0%)	13 (55%)	24 (29%)	51 (0%)
Baringo	413 (61%)	13 (19%)	34 (25%)	54 (0%)	10 (42%)	21 (29%)	46 (0%)
Bomet	260 (41%)	12 (7%)	29 (11%)	38 (0%)	5 (7%)	19 (6%)	33 (0%)
Bungoma	558 (69%)	12 (21%)	31 (25%)	44 (0%)	9 (41%)	18 (25%)	43 (0%)
Busia	245 (55%)	16 (21%)	46 (53%)	46 (0%)	11 (64%)	27 (52%)	59 (0%)
Elgeyo Marakwet	427 (108%)	23 (35%)	36 (31%)	59 (0%)	12 (53%)	23 (22%)	50 (0%)
Embu	193 (50%)	11 (12%)	34 (27%)	53 (0%)	10 (41%)	23 (13%)	44 (0%)
Garissa	67 (32%)	24 (20%)	52 (41%)	61 (0%)	15 (59%)	19 (20%)	61 (0%)
Homa Bay	1099 (123%)	18 (29%)	34 (30%)	64 (0%)	12 (58%)	23 (23%)	49 (0%)
Isiolo	76 (68%)	9 (8%)	40 (26%)	47 (0%)	16 (41%)	30 (30%)	46 (0%)
Kajiado	171 (39%)	23 (40%)	38 (41%)	57 (0%)	12 (44%)	31 (34%)	48 (0%)
Kakamega	643 (72%)	16 (21%)	32 (28%)	48 (0%)	9 (39%)	21 (20%)	43 (0%)
Kericho	276 (52%)	14 (19%)	37 (28%)	63 (0%)	12 (56%)	27 (27%)	44 (0%)

County Data

Kisii County Report

County: Kisii

Zone	Number of classroom visits[1] (Percentage of Target Visits)	English - Class 1 Correct per minute[3] (Percentage at KNEC benchmark[4])	English - Class 2 Correct per minute[3] (Percentage at KNEC benchmark[4])	English - Class 3 Correct per minute[3] (Percentage at KNEC benchmark[4])	Kiswahili - Class 1 Correct per minute[3] (Percentage at KNEC benchmark[4])	Kiswahili - Class 2 Correct per minute[3] (Percentage at KNEC benchmark[4])	Kiswahili - Cl... Correct per mi... (Percentage at benchmark[4]...
Birongo	30 (272%)	36(60%)	22 (6%)	47 (0%)	0	6 (10%)	50 (0%)
Eegetuki Mesesi	48 (228%)	23(46%)	45 (50%)	44 (0%)	5(21%)	18 (18%)	49 (0%)
Etago	22 (169%)	38(66%)	0	57 (0%)	24(100%)	28 (30%)	52 (0%)
Gesabakwa Riontweka	0 (0%)	no data	no data	no data	no data	no data	no data
Gesero	60 (272%)	25(43%)	41 (36%)	53 (0%)	10(6%)	17 (10%)	58 (0%)
Gesusu	0 (0%)	no data	no data	no data	no data	no data	no data
Getembe East	0 (0%)	no data	no data	no data	no data	no data	no data
Getembe West	19 (158%)	30(33%)	81 (100%)	115 (0%)	29(87%)	39 (66%)	64 (0%)
Gucha	6 (75%)	0	53 (33%)	54 (0%)	4(20%)	0	0
Ibacho	25 (125%)	18(33%)	37 (16%)	28 (0%)	6(15%)	21 (0%)	46 (0%)
Ibeno	19 (126%)	0	24 (0%)	20 (0%)	6(20%)	13 (0%)	36 (0%)
Igare Mokwerero	13 (61%)	25(33%)	53 (36%)	0	12(25%)	0	68 (0%)
Igonga	31 (155%)	8(20%)	48 (40%)	41 (0%)	11(35%)	27 (15%)	43 (0%)
Kegogi	27 (245%)	29(55%)	30 (23%)	55 (0%)	12(40%)	15 (0%)	42 (0%)
Kenyenya	13 (108%)	5(0%)	56 (33%)	48 (0%)	8(14%)	21 (0%)	0
Keroka	0 (0%)	no data	no data	no data	no data	no data	no data
Keumbu	14 (93%)	0	28 (14%)	31 (0%)	10(0%)	18 (0%)	54 (0%)
Kiogoro	15 (115%)	9(0%)	19 (0%)	49 (0%)	9(16%)	14 (0%)	32 (0%)
Kionyo Kiobegi	25 (147%)	22(0%)	46 (28%)	67 (0%)	8(63%)	19 (75%)	56 (0%)
Magena Emesa	9 (40%)	0	0	60 (0%)	7(0%)	0	39 (0%)

GPS data

Local level data

School Level Data

External Evaluation by MSI

2016 **2015 & 2016**

204 schools

4896 students

ABC **14 assessments in two languages**

	Class 1	Class 2
Teacher Guide	99%	99%
Pupil books	97%	95%
Exercise books	96%	96%
Pencils	91%	92%
Furniture	89%	88%
Reading books	81%	83%
Decorations	71%	74%
Timetable	59%	61%

Tusome Kiswahili Impacts

Subtask	Class 1			Class 2		
	Baseline	Midline	Difference	Baseline	Midline	Difference
Letter sound knowledge	16.6	29.7	13.1*	16.2	39.7	23.4*
Syllable fluency	11.0	21.5	10.4*	20.9	37.5	16.6*
Invented/non-word decoding	4.7	8.3	3.6*	10.2	16.1	5.8*
Passage reading	4.9	12.2	7.3*	13.5	24.5	11.0*
Reading comprehension	0.4	0.9	0.5*	1.1	2.0	1.0*
Listening comprehension	1.2	2.0	0.8*	1.9	2.0	0.9*

Kiswahili Benchmarks

Legend:
- **Fluent** 45+ CWPM
- **Emergent** 17-44 CWPM
- **Beginning** 1-16 CWPM
- **Zero Reader** 0 CWPM

Class 1 — Baseline: 1%, 12%, 17%, 70%
Class 1 — Midline: 3%, 32%, 21%, 45%
Class 2 — Baseline: 4%, 33%, 19%, 43%
Class 2 — Midline: 12%, 54%, 15%, 19%

23
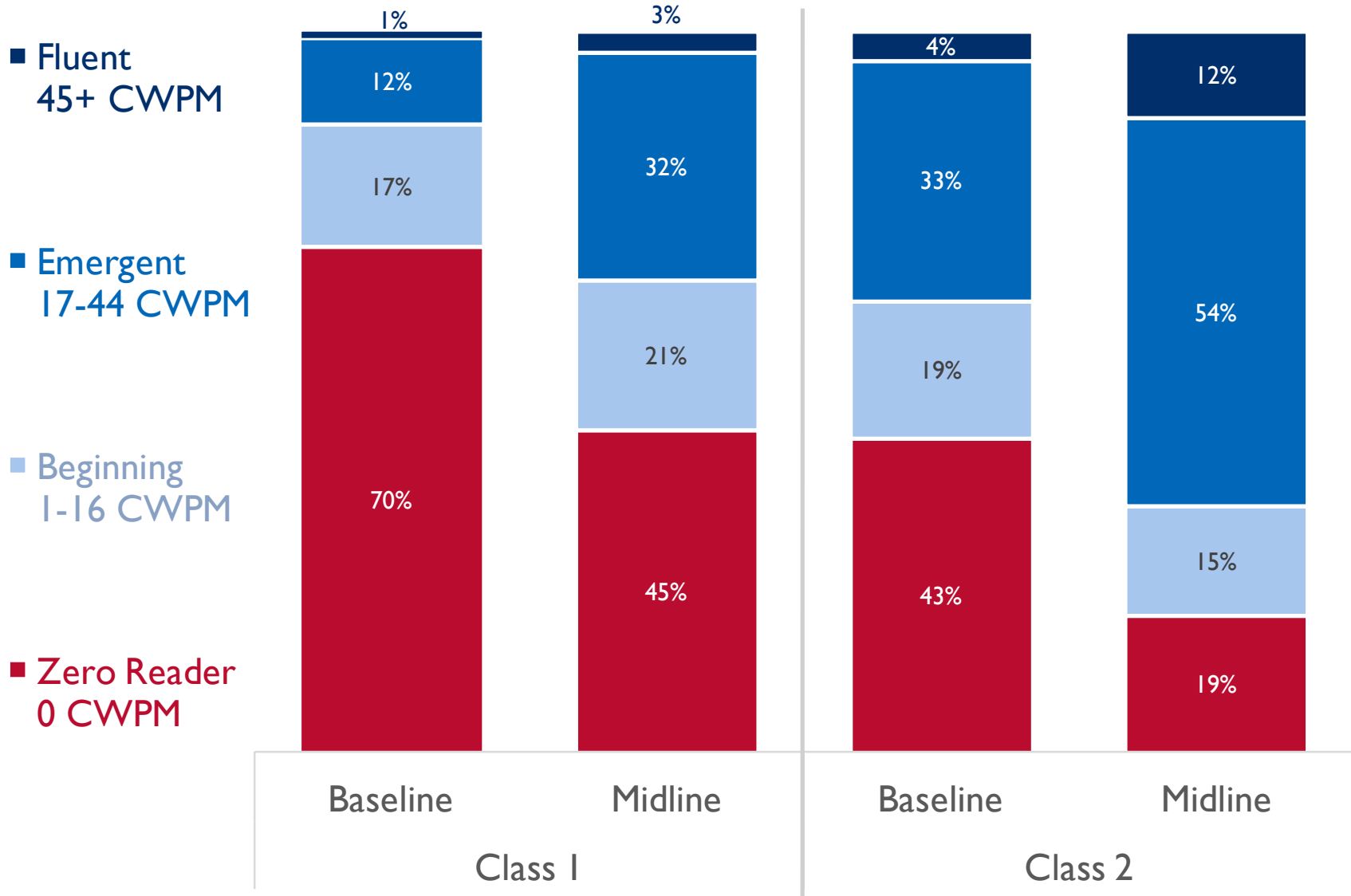
Tusome English Impacts

Subtask	Class 1			Class 2		
	Baseline	Midline	Difference	Baseline	Midline	Difference
Phoneme segmentation	1.1	3.8	2.6*	0.6	5.0	4.5*
Letter sound knowledge	15.1	26.3	11.3*	10.2	32.6	22.4*
Invented/non-word decoding	5.7	10.4	4.7*	10.4	18.6	8.3*
Vocabulary	5.9	7.8	1.9*	8.2	10.2	1.9*
Passage reading (A)	10.6	22.3	11.7*	23.8	43.6	19.9*
Reading comprehension (A)	0.2	0.5	0.3*	0.5	1.0	0.5*
Passage reading (B)	9.7	22.0	12.4*	21.8	44.2	22.5*
Reading comprehension (B)	0.2	0.8	0.6*	0.6	1.7	1.2*

English Benchmarks

Legend:
- Fluent 65+ CWPM
- Emergent 30-64 CWPM
- Beginning 1-29 CWPM
- Zero Reader 0 CWPM

Class 1

Baseline:
- 2%
- 10%
- 35%
- 53%

Midline:
- 18%
- 30%
- 29%
- 23%

Class 2

Baseline:
- 12%
- 22%
- 28%
- 38%

Midline:
- 47%
- 29%
- 11%
- 12%
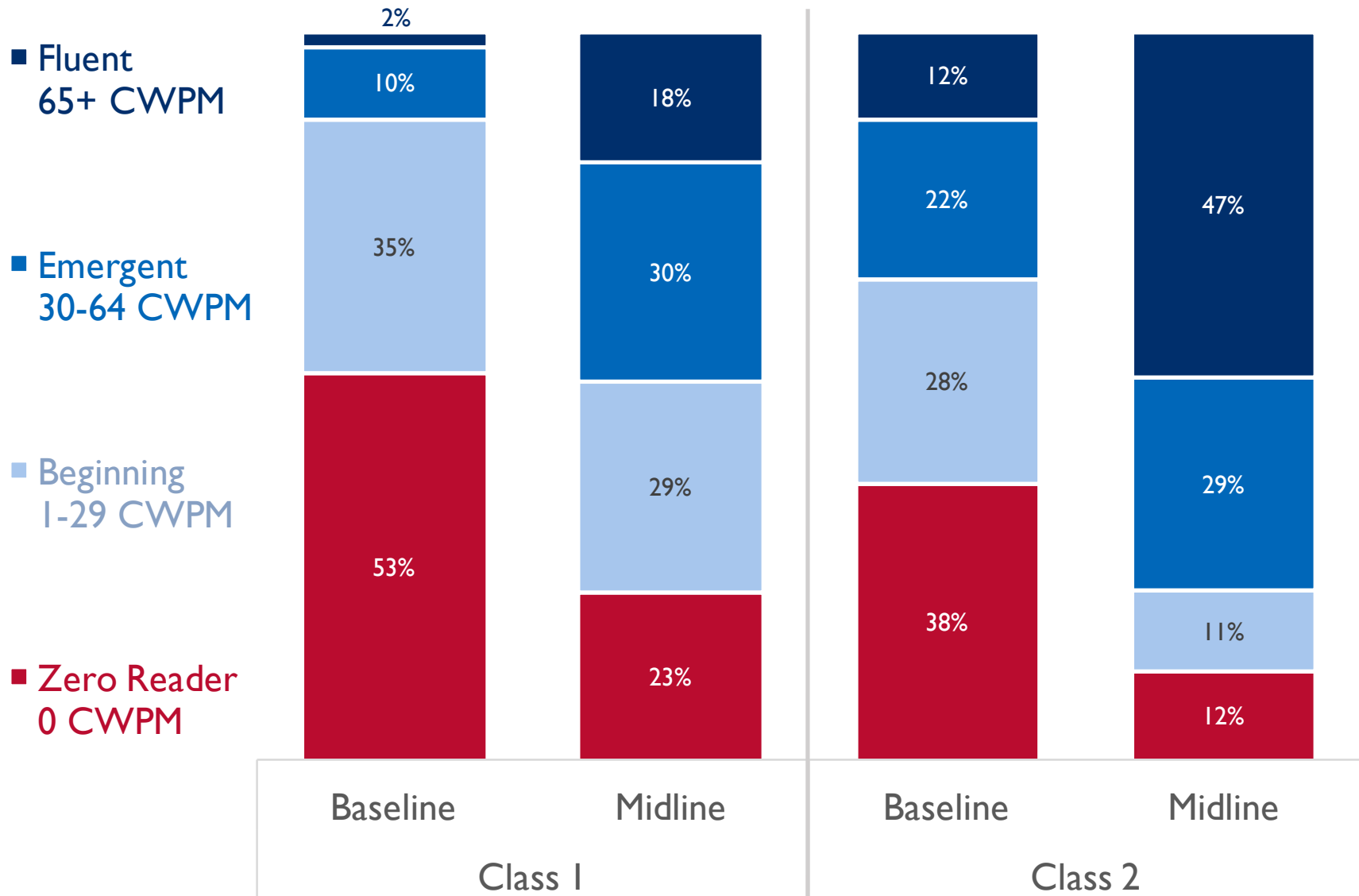
Tusome Effect Sizes

Subtask	English		Kiswahili	
	Class 1	**Class 2**	**Class 1**	**Class 2**
Phoneme segmentation	1.07	2.57	--	--
Letter sound knowledge	0.71	1.63	0.75	1.32
Syllable fluency	--	--	0.66	0.80
Invented/non-word decoding	0.52	0.68	0.45	0.50
Vocabulary	0.48	0.41	--	--
Passage reading (A)	0.67	0.72	0.75	0.71
Reading comprehension (A)	0.40	0.49	0.62	0.69
Passage reading (B)	0.73	0.86	--	--
Reading comprehension (B)	0.75	0.94	--	--
Listening comprehension	--	--	0.52	0.52
Average	.67	1.04	.63	.76

My name is Train.
I am long like a snake.
I carry people and heavy loads.
I move on a railway line.

1.2 million children
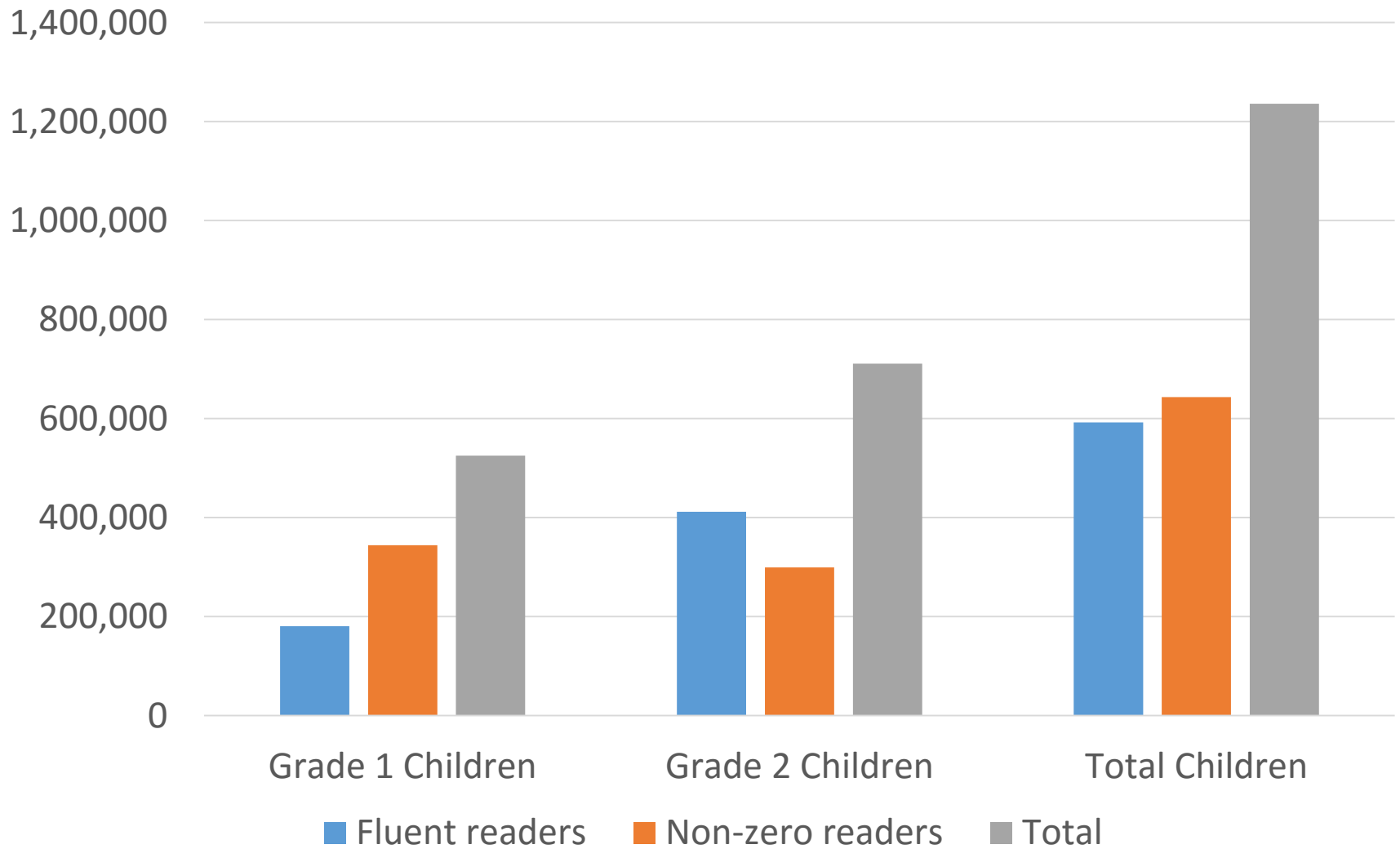
Pilot and Scale Comparisons

Area	Pilot study	National Scale
Complexity	What the literature says	What will work
Key level to influence	Teachers	Middle level officers
Role of Province	Don't get in our way	The actual implementer
Technical emphasis	Fidelity to the script	Just try it
Costs	Not an issue	Lower than control
Coaching staff	Externally hired	Civil servants
Unexpected challenges	Local approvals	Technical knowledge
Keys to success	Technical	Planning & logistics

Kenya PRIMR and Tusome Articles

Gove, A., Korda Poole, M. & Piper, B. (2017). Designing for scale: reflections on rolling out reading improvement in Kenya and Liberia. In A. Gove, A. Mora, & P. McCardle (Eds.), *Progress toward a literate world: Early reading interventions in low-income countries, New Directions for Child and Adolescent Development, 155,* 77-95. DOI: 10.1002/cad.20195

Zuilkowski, S. & Piper, B. (2017). Instructional coaching in Kenya: Supporting teachers to improve literacy outcomes. Book chapter for *International Handbook on Teacher Quality and Policy*, Akiba, M. & LeTendre, G. (Eds), Routledge.

Piper, B., Zuilkowski, S & Ong'ele, S. (2016). Implementing mother tongue instruction in the real world: Results from a medium scale randomized controlled trial in Kenya. *Comparative Education Review*. DOI: 10.1080/17586801.2016.1220354.

Piper, B., Zuilkowski, S., Strigel, C., & Kwayumba, D. (2016). Does technology improve classroom reading outcomes? Comparing the effectiveness and cost-effectiveness of ICT interventions for early grade literacy in Kenya. I*nternational Journal of Educational Development*, 49, 204-214. DOI: 10.1016/j.ijedudev.2016.03.006.

Piper, B., Ralaingita, W., Akach, L & King, S (2016). Improving procedural and conceptual mathematics outcomes: Evidence from a randomized control trial in Kenya. *Journal of Development Effectiveness*, 8(3), 404-422. DOI: 10.1080/19439342.2016.1149502

Piper, B. & Zuilkowski, S. (2016). The role of timing in assessing oral reading fluency and comprehension in Kenya. Language Testing Journal. 33(1), 75-98. DOI: 10.1177/0265532215579529

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Piper, B. & Zuilkowski, S. (2015). Teacher coaching in Kenya: Examining instructional support in formal and nonformal schools. *Teaching and Teacher Education, 47,* 173–183. http://dx.doi.org/10.1016/j.tate.2015.01.001

Piper, B., Jepkemei, E., & Kibukho, K. (2015). Pro-Poor PRIMR: Improving early literacy skills for children from low-income families in Kenya. *Africa Education Review, 12*(1)*,* 68-85. http://dx.doi.org/10.1080/18146627.2015.1036566

Piper, B., Jepkemei, E., & Kwayumba, D., & Kibukho, K. (2015). Kenya's ICT policy in practice: The effectiveness of tablets and e-readers in improving student outcomes. *Forum for International Research in Education*, 2(1), 3-18. Available from http://preserve.lehigh.edu/fire/vol2/iss1/2.

Piper, B. & Zuilkowski, S. (2015). Assessing reading fluency in sub-Saharan Africa: Oral or silent assessment? International Review of Education. 61(2), 153-171. http://dx.doi.org/10.1007/s11159-015-9470-4.

Piper, B., Zuilkowski, S., & Mugenda, A. (2014). Improving reading outcomes in Kenya: First-year effects of the PRIMR initiative. *International Journal of Educational Development, 37,* 11–21. http://dx.doi.org/10.1016/j.ijedudev.2014.02.006

Reflections

- Evidence is powerful
- Planning with key stakeholders
- Be strategic on which stakeholders to bring close
- Test in real world conditions
- Test at medium to large scale
- Innovate and iterate
- Focus on teacher change
- Do less to do more

Thank you!
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Problems of Moving to Scale

- Many successful pilot programs
- Many ineffective large scale programs
- Consistent problems in:
  - Initial take-up
  - Per diem and allowance rates
  - Complaints about extra duties
- Pilot designs were:
  - Too complex
  - Overly dependent on "outlier" educators
  - Did not consider civil servant's job descriptions

Large Scale Implementation - Swing Voters?

Yes!
20%

Maybe…
60%

All our focus should be here

No!
20%
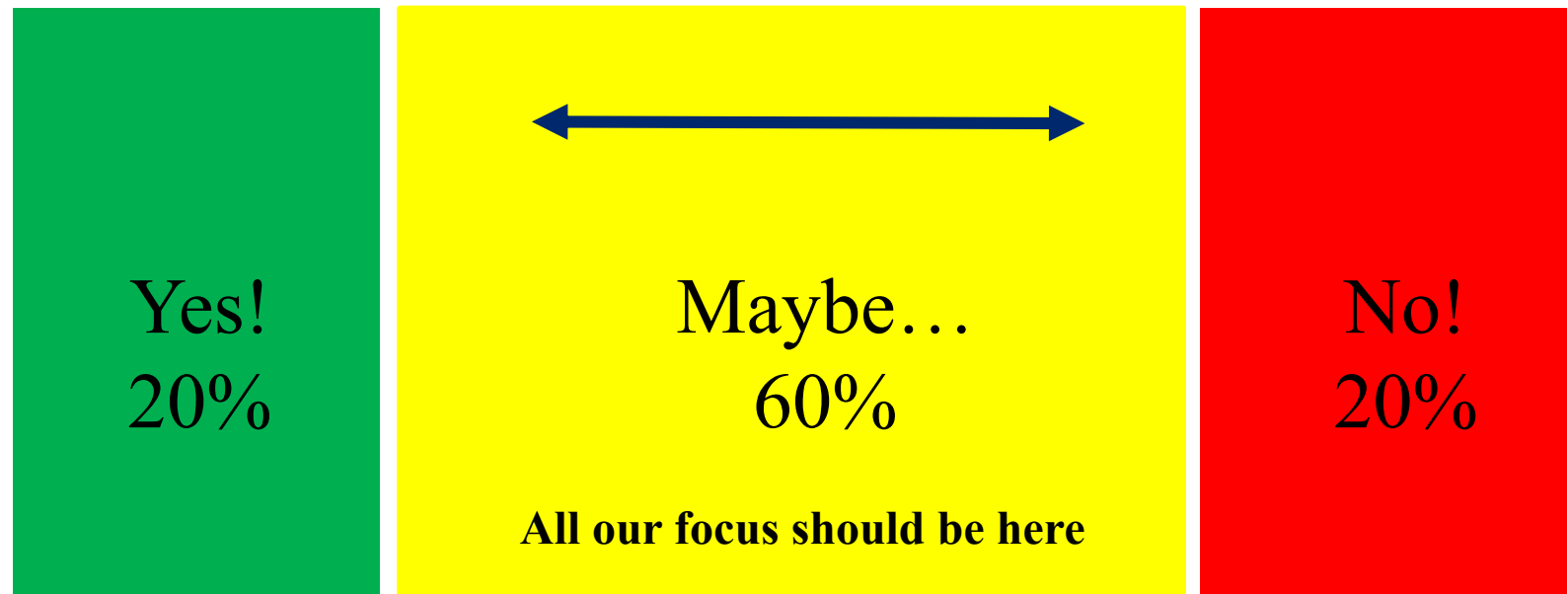
Showcase for donors

This makes us worry

English ORF by Wealth Quintiles