

How to design a randomised evaluation

3ie How-To Videos

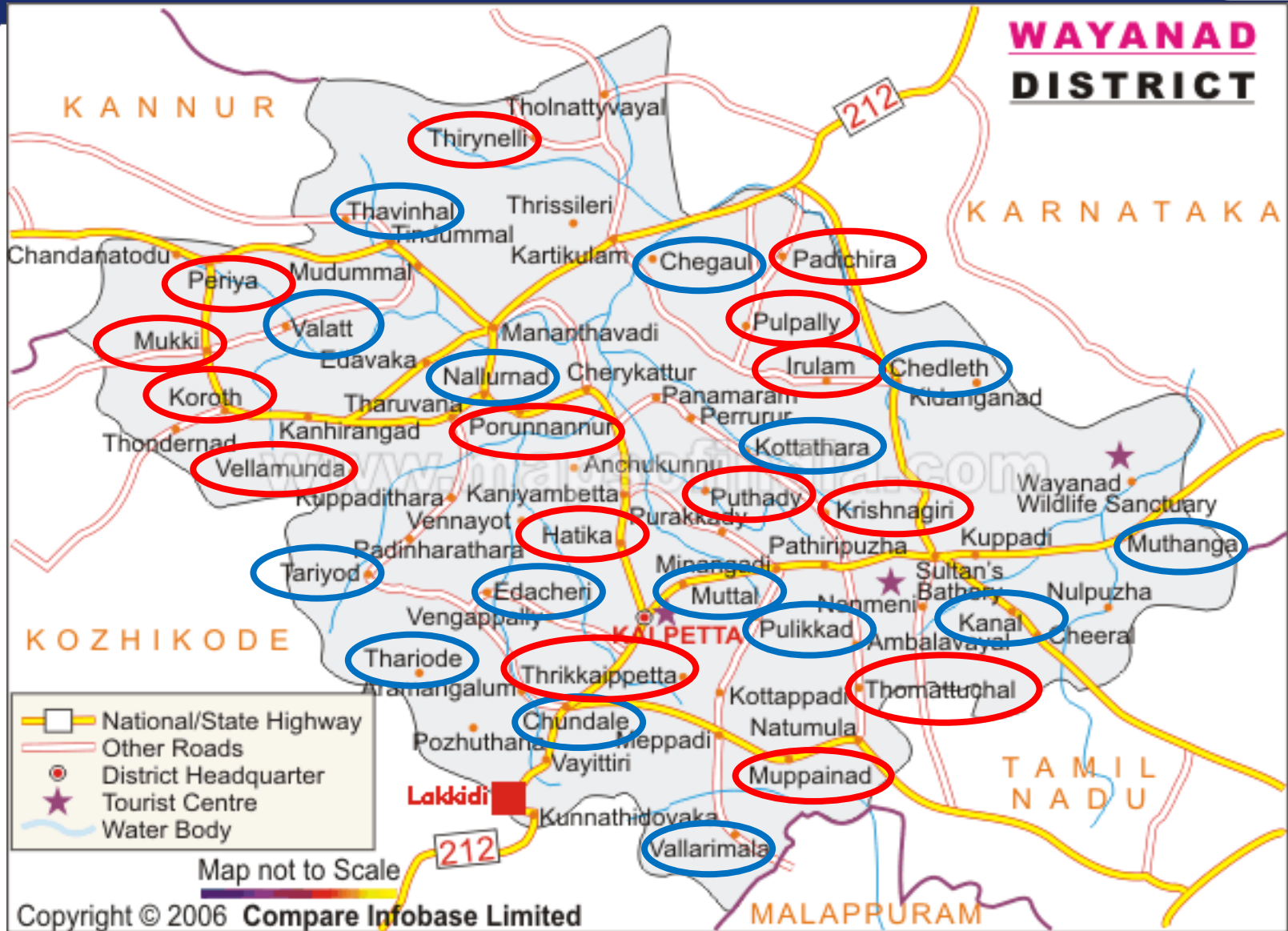
*Howard White, Former Executive Director
International Initiative for Impact Evaluation*

Example

- Random assignment of the treatment
- Not the same as taking a random sample in the project area



15 of the 30 villages picked at random for treatment group, and the rest in the control group






Steps in designing an RCT




1. Define treatment, including eligibility criteria
2. Determine levels of assignment, treatment and analysis
3. Identify eligible population
4. Decide type of RCT
5. Write analysis plan
6. Perform power calculations (allowing for planned subgroup analysis). Don't need to randomize across whole eligible population
7. Draw sample for analysis
8. Assign to treatment and control

Level of assignment, treatment and analysis




		Assignment	Treatment	Analysis
China vitamin pills		School	Child	Child
Mozambique pre-school		Village	Village	Child
Gujarat industrial pollution		Plant	Plant	Plant

- Simple: unit of assignment, treatment and analysis are all the same (usually individual or household, but could be firm)

		Assignment	Treatment	Analysis
Gujarat industrial pollution		Plant	Plant	Plant

Cluster: unit of assignment 'higher' than unit of treatment or analysis

		Assignment	Treatment	Analysis
China vitamin pills		School	Child	Child

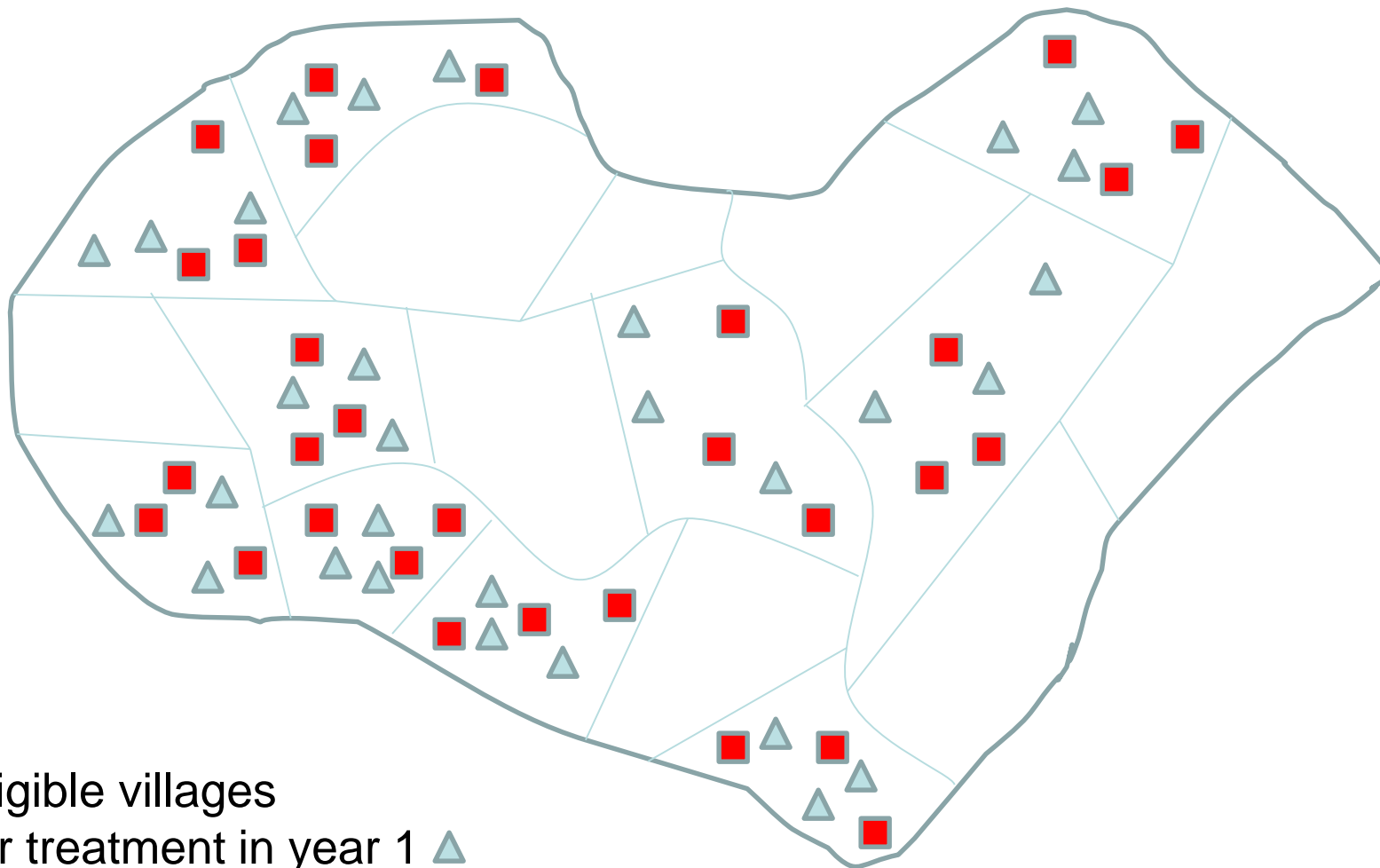
Most development interventions are likely to use a cluster RCT design

RCT design 1: pipeline



- Intervention will be rolled out over time
- Randomly assign units to year of treatment
- Those treated last act as control group
- Example: Progresas/Oportunidades

Pipeline design



60 eligible villages

30 for treatment in year 1 ▲

30 for treatment in year 3 ■ - these villages act as the control group

RCT design 2: raised threshold



Raise eligibility threshold to create 'over-subscription'
E.g. Vocational education in Colombia

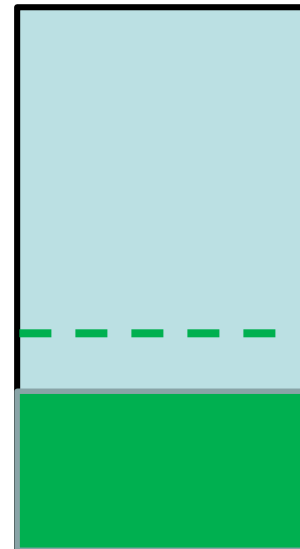
Similarly, if plan to 'treat' 30 districts can identify
60 eligible districts



100
applications

Centre identifies 30,
of which 25 picked at
random. Remaining 5
are control

Usually
accept 25



RCT design 3: Matched pairs



Prior matching, e.g. **matched pairs** can reduce necessary sample size



As one in each pair is treated and one control, balance is more likely

30 eligible villages

- 2 much larger than others
- 2 very close to town
- 2 different ethnic group

Identify pair of similar villages, assign one of the pair to treatment group and other to control group

RCT design 4: multiple-treatment arms

Factorial Design

Three 'arms': treatment A, treatment B, and control C



The more arms the larger the sample required



Don't need a 'no treatment' control: control can be existing practice






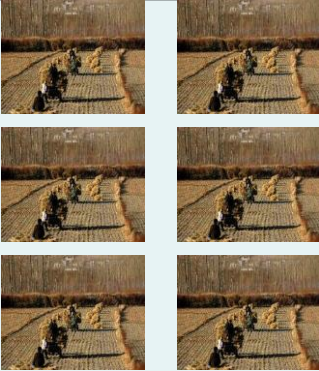
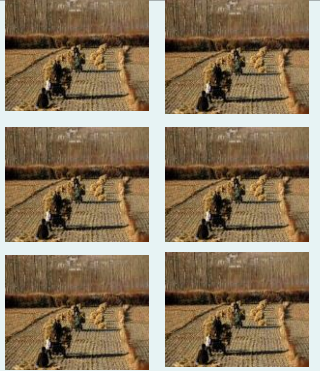
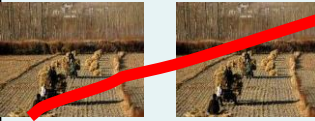
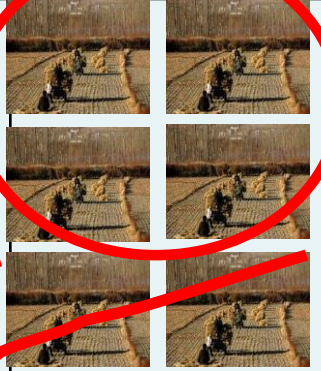


RCT design 5: Encouragement design



Before $Income(t,c) = 200$

After $Income(t) = 240, c=200$

	Treatment	Control		Treatment	Control
Adopt			Already adopted		
			New adopters		
Don't Adopt			Don't adopt		

Photo@D.B.Singh, @Steve Evans

Conclusion

- There are many RCT designs
- So it is very likely you can find one which is right for your intervention
- And many designs have relatively minor implications for programme design
- So randomization should always be considered as an *ex ante* design option