

What breaks between the change and the number

A Theory of Change says how the world is supposed to move; a LogFrame turns that into rows; an indicator turns a row into arithmetic. Something is lost at each translation, and knowing what lets you defend the number.

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Lesson 1 of 8

Indicator Design and the LogFrame — From intention to indicator

What this lesson covers

- Three documents, two translations
- The first translation: change to row
- Fix it at the LogFrame, not at the analysis
- The second translation: row to arithmetic
- Assumptions are the part everyone deletes
- What the levels mean, and where people cheat
- Read the chain backwards as a test
- What comes next

Three documents, two translations

- A **Theory of Change** — a narrative and usually a diagram, saying how the programme believes the world will move and. . .
- A **LogFrame** — a table of goal, outcomes, outputs and activities, each row carrying indicators, means of verification. . .
- An **indicator definition** — arithmetic on a dataset.

The first translation: change to row

If health workers are trained and vaccines are reliably in stock, then caregivers who bring a child for the first dose will complete the schedule, and fewer children will be susceptible to measles at school entry.

The first translation: change to row

Level	Indicator
Output	Number of children receiving penta3

The first translation: change to row

- The mechanism — The theory was about *completion* — children who start the schedule finishing it
- The assumption — "Vaccines reliably in stock" is a condition the theory depends on and no LogFrame row measures
- The population — "Children who are brought for a first dose" is a specific group

Fix it at the LogFrame, not at the analysis — In Python

```
totals = (  
    vax[vax["reported"]]  
    .groupby("antigen")["doses_administered"].sum()  
)  
dropout = (totals["penta1"] - totals["penta3"]) / totals["penta1"]  
print(f"penta1 {totals['penta1']:,}  penta3 {totals['penta3']:,}  dropout {dropout:.1%}")
```

Fix it at the LogFrame, not at the analysis — In R

```
totals <- vax |>
  filter(report_submitted) |>
  summarise(doses = sum(doses_administered), .by = antigen)

p1 <- totals$doses[totals$antigen == "penta1"]
p3 <- totals$doses[totals$antigen == "penta3"]
c(penta1 = p1, penta3 = p3, dropout = (p1 - p3) / p1)
```

Fix it at the LogFrame, not at the analysis

- When the mechanism is measurable, measure the mechanism — A dropout rate and a coverage figure answer different. . .

The second translation: row to arithmetic

- Children or **doses**? A dose count and a child count differ whenever a child is recorded twice, and the register does. . .
- Which **period** — by date of vaccination or date of report?
- Which **facilities** — those that reported, or all of them, with non-reporters counted as zero?
- **Catchment or residence**? A child from the next district vaccinated here.

Assumptions are the part everyone deletes

- Give the important assumptions an indicator of their own — Stock-out days per quarter, road access days, staff vacancy. . .

What the levels mean, and where people cheat

Level	Question	Attribution
Activity	What did we do?	Fully ours
Output	What did that produce, directly?	Fully ours
Outcome	What changed for people?	Shared with everything else
Goal	What changed in the population?	Almost none of it ours

Read the chain backwards as a test

Penta3 dropout rate — measures whether children who start the schedule finish it — which the programme influences through reminders, outreach and stock — which the theory says reduces susceptibility — which is the change we want.

Read the chain backwards as a test

- **The indicator does not measure the mechanism.** Change the indicator.
- **The mechanism is not something the programme influences.** Change the programme's claim, or accept that you are. . .
- **Nobody can name the change.** Stop and have that conversation before collecting anything.

Read the chain backwards as a test

An indicator is a claim about causation compressed into arithmetic. The compression is lossy, and the reference sheet is where you record what was lost.

What comes next

- You now know where an indicator comes from and what it inherits.

Read the full lesson, with runnable code

[https://data-analysis.cassion.dev/courses/indicator-design-logframe/
indicators-01-theory-of-change](https://data-analysis.cassion.dev/courses/indicator-design-logframe/indicators-01-theory-of-change)