

Why admissions over expected caseload is not coverage

The figure most programmes report as coverage is a ratio of two things, neither of which is the number of malnourished children. What coverage actually requires, and what to report when you cannot estimate it.

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Lesson 8 of 8

Nutrition Analysis: CMAM and SMART — Judging a programme

What this lesson covers

- The figure everyone reports
- What it actually measures
- What coverage requires
- The barriers question is the useful half
- What to report when you have no coverage survey
- Where this course leaves you

The figure everyone reports

Programme coverage: 68%

The figure everyone reports — Example

admissions during the period / expected caseload for the period

The figure everyone reports — Example

population under five x GAM prevalence x incidence correction x coverage target

The figure everyone reports — In Python

```
UNDER_FIVE = 21500
GAM_PREVALENCE = 0.149          # from the SMART survey
INCIDENCE_CORRECTION = 1.6      # new cases arising over the year
COVERAGE_TARGET = 0.50

expected = UNDER_FIVE * GAM_PREVALENCE * INCIDENCE_CORRECTION * COVERAGE_TARGET
admissions = 1100

print(f"expected caseload {expected:,.0f}; admissions {admissions:,}; "
      f"'coverage' {admissions / expected:.0%}")
```

The figure everyone reports — In R

```
expected <- 21500 * 0.149 * 1.6 * 0.50  
c(expected = expected, ratio = 1100 / expected)
```

The figure everyone reports

- That number is not coverage — It is worth being precise about what it is, because it is not useless — it is just not. . .

What it actually measures

- The numerator is admissions, not children — A child readmitted after relapse is two admissions
- The denominator is a forecast, not a count — Every term in it is an estimate: the population from a census projection, . . .
- The coverage target is in the denominator — Look at it again

What it actually measures — In Python

```
without_target = admissions / (UNDER_FIVE * GAM_PREVALENCE * INCIDENCE_CORRECTION)
print(f"ratio without the coverage target in the denominator: {without_target:.0%}")
```

What it actually measures — In R

```
1100 / (21500 * 0.149 * 1.6)
```

What coverage requires — Example

children with SAM currently in the programme

children with SAM in the population

What coverage requires — In Python

```
# What a coverage survey produces, and a register never can  
cases_found = 84  
cases_in_programme = 39  
print(f"point coverage: {cases_in_programme / cases_found:.0%}")
```

What coverage requires — In R

```
c(point_coverage = 39 / 84)
```

What coverage requires

- **Point coverage** — cases currently in the programme, over cases found. Suits a programme with short treatment. . .
- **Period coverage** — cases in the programme or recently discharged cured, over cases found. Suits longer episodes, and. . .
- State which — They differ by several points and both are called coverage

The barriers question is the useful half

- **Did not know the child was malnourished** — screening and community awareness.
- **Did not know the programme existed** — mobilisation.
- **Distance, cost, time** — decentralisation, which is also the defaulting cause from the previous lesson.
- **Rejected previously** — an admission criterion problem, and lesson 4 explains how a child can be rejected on one. . .
- **Stigma, or a previous bad experience** — quality of care.

The barriers question is the useful half — In Python

```
barriers = pd.DataFrame({
    "barrier": ["Did not know child was malnourished", "Distance",
               "Did not know programme existed", "Previously rejected",
               "Carer unavailable"],
    "cases": [17, 12, 8, 5, 3],
})
barriers["share"] = barriers["cases"] / barriers["cases"].sum()
```

The barriers question is the useful half — In R

```
barriers <- tibble::tribble(  
  ~barrier,          ~cases,  
  "unaware child malnourished", 17,  
  "distance",             12,  
  "unaware of programme",      8,  
  "previously rejected",       5,  
  "carer unavailable",         3  
)
```

The barriers question is the useful half

- Report the barriers even when the coverage estimate is too imprecise to use —
Forty-five interviews cannot pin a...

What to report when you have no coverage survey

- Report the plan achievement ratio, correctly named — "Admissions were 68% of the caseload planned for the period" is. . .
- Report admissions against expected incident cases, with the assumptions stated — Drop the coverage target from the. . .
- Use the routine-to-survey ratio — The DHIS2 course's last lesson decomposed the gap between a screening register and a. . .

What to report when you have no coverage survey — In Python

```
report = pd.DataFrame({
    "indicator": ["Admissions", "Expected incident cases", "Plan achievement",
                  "Coverage"],
    "value": [1100, 5126, "21%", "not estimated"],
    "note": ["episodes, not children",
             "population x prevalence x incidence correction; three estimates",
             "admissions / expected incident cases",
             "requires active case-finding in the community"],
})
```

What to report when you have no coverage survey — In R

```
tibble::tribble(  
  ~indicator,          ~value,          ~note,  
  "Admissions",        "1,100",        "episodes, not children",  
  "Expected incident cases", "5,126",        "three stacked estimates",  
  "Plan achievement",    "21%",          "admissions / expected",  
  "Coverage",           "not estimated", "requires a coverage survey"  
)
```

Where this course leaves you

- You can measure a child, compute a z-score against the WHO standards, apply the case definitions including the clause everyone drops, say where the two admission criteria disagree and why, run a SMART plausibility report and decide whether a survey can be believed, produce a prevalence with an interval and read it against the IPC phases, compute CMAM performance on the denominator Sphere specifies, and say honestly what your programme does and does not know about coverage.

Read the full lesson, with runnable code

[https://data-analysis.cassion.dev/courses/nutrition-analysis-cmam-smart/
nutrition-08-coverage](https://data-analysis.cassion.dev/courses/nutrition-analysis-cmam-smart/nutrition-08-coverage)