Prophylactic Antibiotic Regimen Selection for Surgery
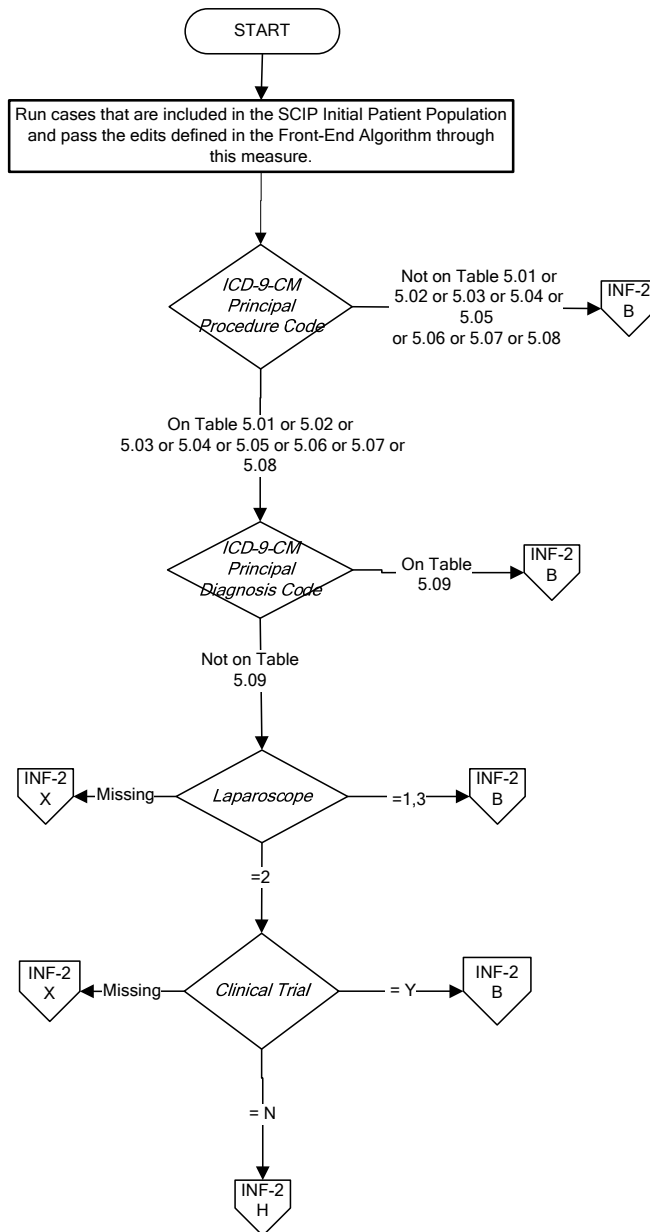
Surgical Procedure	Approved Antibiotics
CABG, Other Cardiac or Vascular	Cefazolin, Cefuroxime, Table 3.1 or Vancomycin** Table 3.8 If β-lactam allergy: Vancomycin* Table 3.8 or Clindamycin* Table 3.9
Hip/Knee Arthroplasty	Cefazolin or Cefuroxime Table 3.2 or Vancomycin** Table 3.8 If β-lactam allergy: Vancomycin* Table 3.8 or Clindamycin* Table 3.9
Colon	Cefotetan, Cefoxitin, Ampicillin/Sulbactam Table 3.5, or Ertapenem† Table 3.6b **OR** Cefazolin or Cefuroxime Table 3.2 + Metronidazole Table 3.6a If β-lactam allergy: Clindamycin Table 3.9 + Aminoglycoside Table 2.11 , or Clindamycin Table 3.9 + Quinolone Table 3.12, or Clindamycin Table 3.9 + Aztreonam Table 2.7 **OR** Metronidazole Table 3.6a with Aminoglycoside Table 2.11, or Metronidazole Table 3.6a + Quinolone Table 3.12
Hysterectomy	Cefotetan, Cefazolin, Cefoxitin, Cefuroxime, or Ampicillin/Sulbactam Table 3.7 If β-lactam allergy: Clindamycin Table 3.9 **OR** Metronidazole Table 3.6a
Special Considerations	*For cardiac, orthopedic, and vascular surgery, if the patient is allergic to β-lactam antibiotics, Vancomycin or Clindamycin are acceptable substitutes. **Vancomycin is acceptable with a physician/APN/PA documented justification for its use (see data element *Vancomycin*) † A single dose of ertapenem is recommended for colon procedures.

SCIP-INF-2: Prophylactic Antibiotic Selection for Surgical Patients

Numerator: Number of surgical patients who received prophylactic antibiotics recommended for their specific surgical procedure.

Denominator: All selected surgical patients with no evidence of prior infection.

Variable Key:
Antibiotic Days I
Antibiotic Timing I
Antibiotic Days II
Antibiotic Timing II
Surgery Days
Abxday Flag

START

Run cases that are included in the SCIP Initial Patient Population and pass the edits defined in the Front-End Algorithm through this measure.

ICD-9-CM Principal Procedure Code

Not on Table 5.01 or 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08 → INF-2 B

On Table 5.01 or 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08

ICD-9-CM Principal Diagnosis Code

On Table 5.09 → INF-2 B

Not on Table 5.09

Laparoscope
- Missing → INF-2 X
- =1,3 → INF-2 B
- =2

Clinical Trial
- Missing → INF-2 X
- = Y → INF-2 B
- = N → INF-2 H

Stratification Table:

Set#	Stratified By	*Principal Procedure Code (Allowable Value)
SCIP-INF2a	Overall Rate	**
SCIP-INF2b	CABG	Table 5.01
SCIP-INF2c	Other Cardiac Surgery	Table 5.02
SCIP-INF2d	Hip Arthroplasty	Table 5.04
SCIP-INF2e	Knee Arthroplasty	Table 5.05
SCIP-INF2f	Colon Surgery	Table 5.03
SCIP-INF2g	Hysterectomy	Table 5.06 Or 5.07
SCIP-INF2h	Vascular Surgery	Table 5.08

* This refers to the data element *'ICD-9-CM Principal Procedure Code'.* Each case will be stratified according to the principal procedure code, after the Category Assignments are completed and the overall rate is calculated.

** No allowable value exists for the overall rate. It includes all procedures on Tables 5.01 to 5.08.

```
                              ┌───────┐
                              │ INF-2 │
                              │   H   │
                              └───┬───┘
                                  │
                                  ▼
┌───────┐                    ╱─────────╲                    ┌───────┐
│ INF-2 │◄──── Missing ─────╱  Surgery   ╲──── =UTD ───────►│ INF-2 │
│   X   │                   ╲ Start Date ╱                  │   D   │
└───────┘                    ╲─────────╱                    └───────┘
                                  │
                            Non-UTD Value
                                  │
                                  ▼
        ┌──────────────────────────────────────────────────┐
        │ Surgery Days (in days) = Surgery Start Date –      │
        │                          Admission Date            │
        └──────────────────────┬───────────────────────────┘
                                  │
                                  ▼
                             ╱─────────╲                     ┌───────┐
                            ╱  Surgery   ╲──── < 0 ──────────►│ INF-2 │
                            ╲    Days    ╱                    │   B   │
                             ╲─────────╱                     └───────┘
                                  │
                                 ≥ 0
                                  │
                                  ▼
┌───────┐                   ╱───────────╲                    ┌───────┐     ┌───────┐
│ INF-2 │◄─── Missing ─────╱  Infection   ╲──── = Y ────────►│ INF-2 │     │ INF-2 │
│   X   │                  ╲  Prior to    ╱                   │   B   │     │   X   │
└───────┘                   ╲ Anesthesia ╱                    └───────┘     └───▲───┘
                                  │                                             │
                                = N                                         Missing
                                  │                                             │
                                  ▼                                             │
                             ╱──────────╲      On Table          ╱──────────╲   │         ┌───────┐
                            ╱ ICD-9-CM    ╲──── 5.04 ───────────►╱  Joint     ╲──┴── =Y ──►│ INF-2 │
                            ╲ Principal   ╱     or 5.05          ╲  Revision  ╱            │   B   │
                             ╲ Proc. Code╱                        ╲──────────╱            └───────┘
                                  │                                   │
                           Not on Table                             = N
                          5.04 or 5.05                                │
                                  │◄──────────────────────────────────┘
                                  ▼
┌───────┐                   ╱──────────╲                     ┌───────┐
│ INF-2 │◄─── Missing ─────╱ Perioperative╲──── =Y ─────────►│ INF-2 │
│   X   │                  ╲    Death     ╱                   │   B   │
└───────┘                   ╲──────────╱                     └───────┘
                                  │
                                = N
                                  │
                                  ▼
┌───────┐              ╱──────────╲                                   ╱────────────╲   Not on   ┌───────┐
│ INF-2 │◄── Missing ─╱  Antibiotic ╲──── = 1, 2 ───────────────────►╱ ICD-9-CM     ╲─ Table ──►│ INF-2 │
│   X   │             ╲  Received   ╱                                 ╲ Principal    ╱  5.03     │   B   │
└───────┘              ╲──────────╱                                    ╲ Proc. Code ╱            └───────┘
                            │                                              │
                         = 3, 4                                       On Table 5.03
                            │                                              │
                            ▼                                              ▼
                      ╱──────────╲         ┌───────┐      ┌───────┐   ╱──────────╲            ┌───────┐
                     ╱ Antibiotic  ╲─ = 4 ►│ INF-2 │      │ INF-2 │◄─╱   Oral     ╲── = N ───►│ INF-2 │
                     ╲  Received   ╱       │   B   │      │   X   │  ╲  Antibiotics╱           │   B   │
                      ╲──────────╱         └───────┘      └───────┘   ╲──────────╱            └───────┘
                            │               Missing                        │
                          = 3                                            =Y
                            │                                              │
                            │                                              ▼
                            │                                         ╱──────────╲            ┌───────┐
                            │                                        ╱ Antibiotic  ╲── = 1 ──►│ INF-2 │
                            │                                        ╲  Received   ╱          │   B   │
                            │                                         ╲──────────╱           └───────┘
                            │                                              │
                            │                                             =2
                            ▼                                              │
                        ┌───────┐                                          │
                        │ INF-2 │◄─────────────────────────────────────────┘
                        │   I   │
                        └───────┘
```

INF-2
I

Antibiotic Name — Antibiotic Grid Not Populated → INF-2 D

Note: The front-end edits reject cases containing invalid data and/or an incomplete Antibiotic Grid. A complete Antibiotic Grid requires all data elements in the row to contain either a valid value and/or 'UTD'.

On Table 2.1 for at least one antibiotic

Note: Proceed only with antibiotic doses on Table 2.1 in Appendix C.

Antibiotic Administration Route — =3,10 for all antibiotic doses → INF-2 B

=1,2 for any antibiotic dose
Proceed only with antibiotic doses on Table 2.1 that are administered via routes '1' or '2'.

Antibiotic Administration Date — =UTD for all antibiotic doses → INF-2 D

Note: Proceed only with antibiotic doses that have an associated non-UTD date.

Non-UTD date for at least one antibiotic dose

Antibiotic Days I = *Surgery Start Date - Antibiotic Administration Date* (in days)

Antibiotic Days I — > 1 for at least one antibiotic dose ────────────────────┐

≤ 1 for all antibiotic doses

Antibiotic Days I — ≤ 0 for ALL antibiotic doses → INF-2 J

=1 for ANY antibiotic dose

INF-2 X ← Missing — *Surgical Incision Time* — =UTD → INF-2 D

Non-UTD Value

Antibiotic Administration Time — = UTD for all antibiotic doses → INF-2 D

Non-UTD time for at least one antibiotic dose

Antibiotic Administration Time — =UTD for ANY antibiotic dose with 'Antibiotic Days I = 1' → INF-2 D

Non-UTD time for ALL antibiotic doses with 'Antibiotic Days I = 1'

Antibiotic Timing I = *Surgery Start Date and Surgical Incision Time - Antibiotic Administration Date and Antibiotic Administration Time* (in minutes).
Calculate Antibiotic Timing I for all antibiotic doses with non-UTD date and time.
Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I ≤ 0.

Antibiotic Timing I — > 1440 minutes for any antibiotic dose. Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I ≤ 0. → *ICD-9-CM Principal Procedure Code* — Not on Table 5.03 → INF-2 B

≤ 1440 minutes for all antibiotic doses with non-UTD date and time. Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I ≤ 0.

On Table 5.03

INF-2 X ← Missing — *Oral Antibiotics* — = N → INF-2 B

=Y

INF-2 J

```
                          ┌─────────┐
                          │ INF-2   │
                          │   J     │
                          └────┬────┘
                               │
                               ▼
  ┌─────────┐           ◇─────────────◇            ┌─────────┐
  │ INF-2   │◄──Missing──│ Surgery End │───=UTD───►│ INF-2   │
  │   X     │           │    Date     │            │   D     │
  └─────────┘           ◇─────────────◇            └─────────┘
                               │
                          Non-UTD Value
                               │
                               ▼
  ┌───────────────────────────────────────────────────────────┐
  │ Antibiotic Days II = Antibiotic Administration Date -      │
  │ Surgery End Date (in days)                                 │
  └───────────────────────────────────────────────────────────┘
                               │
                               ▼
                      ◇─────────────◇        ≤ 0 for all doses    ┌─────────┐
                      │ Antibiotic  │────────of all Antibiotics──►│ INF-2   │
                      │  Days II    │                             │   K     │
                      ◇─────────────◇                             └─────────┘
                               │
            > 0 for at least one dose of any antibiotic
                               │
                               ▼
  ┌───────────────────────────────────────────────────────────┐
  │ Initialize Abxday flag = 'No' for each antibiotic doses.   │
  │ Set Abxday flag = 'Yes' for each antibiotic dose where     │
  │ Antibiotic Days II<= 0.                                    │
  └───────────────────────────────────────────────────────────┘
                               │
                               ▼
  ┌─────────┐           ◇─────────────◇         ◇───────────◇  =No for  ┌─────────┐
  │ INF-2   │◄──Missing──│ Surgery End │──=UTD──►│ Abxday    │──All doses─►│ INF-2   │
  │   X     │           │    Time     │         │  flag     │             │   D     │
  └─────────┘           ◇─────────────◇         ◇───────────◇             └─────────┘
                               │                      │
                          Non-UTD Value      =Yes for ANY dose. Proceed
                               │              with Abxday flag=Yes.
                               ▼
                   ◇──────────────────◇    =UTD for all    ◇───────────◇  =No for   ┌─────────┐
                   │    Antibiotic    │──antibiotic doses─►│ Abxday    │─ALL Doses─►│ INF-2   │
                   │  Administration  │                    │  flag     │            │   D     │
                   │      Time        │                    ◇───────────◇            └─────────┘
                   ◇──────────────────◇                          │
                               │                       =Yes for ANY dose.
            Non-UTD time for at least one              Proceed with Abxday
            antibiotic dose. Proceed with both         flag=Yes.
            UTD and Non-UTD time.
                               │
                               ▼
  ┌───────────────────────────────────────────────────────────┐
  │ Antibiotic Timing II = Antibiotic Administration Date and  │
  │ Antibiotic Administration Time - Surgery End Date and      │
  │ Surgery End Time (in minutes).                             │
  │ Calculate Antibiotic Timing II for all antibiotic doses    │
  │ with non-UTD date and time.                                │
  │ Proceed with antibiotic doses that have Antibiotic Timing  │
  │ II calculated, or Abxday flag = Yes.                       │
  └───────────────────────────────────────────────────────────┘
                               │
                               ▼
                   ◇───────────◇   > 1440 minutes for all
                   │ Antibiotic│   doses of all Antibiotics
                   │ Timing II │   with non-UTD date and time.    ◇───────────◇ =No for  ┌─────────┐
                   ◇───────────◇   Proceed with antibiotic doses──│ Abxday    │─ALL Doses►│ INF-2   │
                               │   that have Antibiotic Timing II │  flag     │           │   B     │
                               │   calculated, or Abxday flag = Yes◇───────────◇          └─────────┘
                               │                                        │
         <= 1440 minutes for at least                       =Yes for ANY dose. Proceed
         one dose of ANY Antibiotic. Proceed with antibiotic with Abxday flag=Yes.
         doses that have Antibiotic Timing II calculated,
         or Abxday flag = Yes.
                               │
                               ▼
  ┌───────────────────────────────────────────────────────────┐
  │ For each case, proceed ONLY with those antibiotic doses    │
  │ that satisfy at least one of the following conditions:     │
  │         Antibiotic Timing II <= 1440.                      │
  │              Abxday flag = Y                               │
  └───────────────────────────────────────────────────────────┘
                               │
                               ▼
                          ┌─────────┐
                          │ INF-2   │
                          │   K     │
                          └─────────┘
```

```
                    ┌────────┐
                    │ INF-2  │
                    │   K    │
                    └───┬────┘
                        │
                        ▼
              ╱─────────────────╲           = 1 for all              ┌────────┐
             ╱    Antibiotic     ╲      doses of all Antibiotics      │ INF-2  │
            ╱   Administration    ╲──────────────────────────────────▶│   D    │
             ╲      Route         ╱                                    └────────┘
              ╲─────────────────╱
                        │
                        │                   ┌──────────────────────────────────────────┐
= 2 for any dose of any Antibiotic          │ Note: For each case include only those   │
                        │                   │ antibiotics with routes IV for further    │
                        │                   │ processing                                │
                        ▼                   └──────────────────────────────────────────┘
              ╱─────────────────╲                                    ┌────────┐
             ╱  ICD-9-CM Principal╲        On Table 5.03              │ INF-2  │
            ╱   Procedure Code     ╲───────────────────────────────▶│   L    │
             ╲                     ╱                                  └────────┘
              ╲─────────────────╱
                        │
                        │
   On Table 5.01 or 5.02 or
   5.04 or 5.05 or 5.06 or 5.07 or 5.08
                        │
                        ▼
              ╱─────────────────╲                         ╱──────────╲    On Table    ┌────────┐
             ╱  ICD-9-CM Principal╲   On Table 5.06 or 5.07╱ Antibiotic ╲     3.7      │ INF-2  │
            ╱   Procedure Code     ╲─────────────────────▶╲   Name     ╱───────────▶│   E    │
             ╲                     ╱                        ╲──────────╱              └────────┘
              ╲─────────────────╱                               │
                        │                                   Not on Table 3.7
   On Table 5.01 or 5.02                                        │
   or 5.04 or 5.05 or 5.08                                      ▼
                        │                                   ┌────────┐
                        │                                   │ INF-2  │
                        ▼                                   │   M    │
              ╱─────────────────╲                           └────────┘
             ╱  ICD-9-CM         ╲  On Tables 5.01,  ╱──────────╲   On Table    ┌────────┐
            ╱   Principal         ╲   5.02, 5.08    ╱ Antibiotic ╲    3.1        │ INF-2  │
             ╲  Procedure Code    ╱───────────────▶╲   Name     ╱────────────▶│   E    │
              ╲─────────────────╱                   ╲──────────╱              └────────┘
                        │                                │
                        │                           Not on Table 3.1
   On Table 5.04 or 5.05                                 │
                        │                                ▼
                        │                            ┌────────┐
                        ▼                            │ INF-2  │
              ╱─────────────────╲                    │   M    │
             ╱   Antibiotic      ╲   On Table        └────────┘
            ╱    Name             ╲    3.2           ┌────────┐
             ╲                    ╱─────────────────▶│ INF-2  │
              ╲─────────────────╱                    │   E    │
                        │                            └────────┘
                Not on Table 3.2
                        │
                        ▼
                    ┌────────┐
                    │ INF-2  │
                    │   M    │
                    └────────┘
```

INF-2
L

Antibiotic
Name —On Table 3.6b▶ INF-2
E

Not on Table 3.6b

Antibiotic
Name —On Table 3.5▶ INF-2
E

Not on Table 3.5

Antibiotic
Name —On Table 3.2▶ Antibiotic
Name —On Table
3.6a▶ INF-2
E

Not on Table 3.2

◀—Not on Table 3.6a—

INF-2
M

Inf-2
M

ICD-9-CM
Principal
Procedure Code

On Tables 5.01, 5.02, 5.04, 5.05, 5.08

Antibiotic
Name

None on Table 3.8 and None on Table 3.9

Inf-2
D

At least one on Table 3.8 or 3.9

Antibiotic
Allergy

Missing

Inf-2
X

=Y

Inf-2
E

=N

Antibiotic
Name

None on Table 3.8

Inf-2
D

At least one on Table 3.8

Vancomycin

Missing

Inf-2
X

Inf-2
X

Case Will
Be Rejected
X

For Overall Rate (Inf-2a)

On Tables 5.03, 5.06, 5.07

Antibiotic
Allergy

Missing

Inf-2
X

= N

Inf-2
D

Any = 9
And
None = 1,2,3,4,5,6, 7, 8, 10, 11

Any =1,2,3,4,5,6,7,8, 10, 11 and none = 9

= Y

ICD-9-CM
Principal
Procedure Code

On Table 5.06, 5.07

Antibiotic
Name

At least one on Tables 3.9 Or 3.6a

None on Tables 3.9 or 3.6a

Inf-2
D

On Table 5.03

Antibiotic
Name

At least one on Table 3.9

Antibiotic
Name

At least one on Tables 2.11 or 3.12 or 2.7

None on Table 3.9

None on Tables 2.11 or 3.12 or 2.7

Inf-2
E

Inf-2
E

In Numerator
Population
E

For Overall Rate (Inf-2a)

Antibiotic
Name

At least one on Table 3.6a

Antibiotic
Name

At least one on Tables 2.11 or 3.12

None on Table 3.6a

None on Tables 2.11 or 3.12

INF-2
B

For Overall Rate (INF-2a)

Not in Measure
Population
B

Inf-2
D

In Measure
Population
D

Inf-2
D

For Overall Rate (Inf-2a)

Inf-2
N

STOP here for CMS. CONTINUE to "N" for The Joint Commission.

For all Stratified
Measures (b-h)

B

Not In Measure
Population

Note: Initialize the *Measure Category Assignment* for each strata measure (b-g) = 'B'.

Do not change the *Measure Category Assignment* that was already calculated for the overall rate (SCIP-INF-2a).

The rest of the algorithm will reset the appropriate *Measure Category Assignment* to be equal to the overall rate's (SCIP-INF-2a) *Measure Category Assignment*

Overall Rate
Category Assignment

= B or X

Set the *Measure Category Assignment*
for the strata measures (SCIP-INF-2b
through SCIP-INF-2h) = 'B'

INF-2
Z

= D or E

For Stratified Measure
SCIP-INF-2b

*ICD-9-CM
Principal
Procedure Code*

On Table 5.01

Set the *Measure Category Assignment*
for measure SCIP-INF-2b = the
Measure Category Assignment for
measure SCIP-INF-2a

INF-2
Z

On Table 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08

For Stratified Measure
SCIP-INF-2c

*ICD-9-CM
Principal
Procedure Code*

On Table 5.02

Set the *Measure Category
Assignment* for SCIP-INF-2c = the
Measure Category Assignment for
measure SCIP-INF-2a

INF-2
Z

On Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08

For Stratified Measure
SCIP-INF-2d

*ICD-9-CM
Principal
Procedure Code*

On Table 5.04

Set the *Measure Category Assignment*
for measure SCIP-INF-2d = the
Measure Category Assignment for
measure SCIP-INF-2a

INF-2
Z

On Table 5.03 or 5.05 or 5.06 or 5.07 or 5.08

INF-2
O

INF-2
O

For Stratified Measure
SCIP-INF-2e

ICD-9-CM Principal Procedure Code —On Table 5.05→ Set the *Measure Category Assignment* for measure SCIP-INF-2e = the *Measure Category Assignment* for measure SCIP-INF-2a

On Table 5.03 or 5.06 or 5.07 or 5.08

For Stratified Measure
SCIP-INF-2f

ICD-9-CM Principal Procedure Code —On Table 5.03→ Set the *Measure Category Assignment* for measure SCIP-INF-2f = the *Measure Category Assignment* for measure SCIP-INF-2a

On Table 5.06 or 5.07 or 5.08

For Stratified Measure
SCIP-INF-2g

ICD-9-CM Principal Procedure Code —On Table 5.06 or 5.07→ Set the *Measure Category Assignment* for measure SCIP-INF-2g = the *Measure Category Assignment* for measure SCIP-INF-2a

On Table 5.08

For Stratified Measure
SCIP-INF-2h

Set the *Measure Category Assignment* for measure SCIP-INF-2h = the *Measure Category Assignment* for measure SCIP-INF-2a

INF-2
Z

Stop