

# Sweden

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## OECD Survey of National Pesticide Risk Indicators, 1999-2000

### COUNTRY, MINISTRY

Sweden

National Chemicals Inspectorate (Ministry of Environment)

### CONTACT PERSON

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### INDICATOR NAME

Swedish Environmental Risk Indicator

### WHEN AND WHY WAS THE INDICATOR DEVELOPED?

The primary purpose of the nationally developed risk indicators has been as a policy tool, to be used to measure progress of the completed first two stages of the risk reduction programme. Currently, they are used as estimation tools when setting the goals for the succeeding stage of the programme, which will continue to the year 2001.

### HOW HAS THE INDICATOR BEEN USED?

To measure progress over time in the national risk reduction programme on pesticides.  
To communicate pesticide risk reduction in a simple manner to politicians and the public.

### DESCRIPTION OF THE INDICATOR:

#### TYPES OF RISK

Aquatic, Terrestrial, Fate  
Acute and Long-term (aquatic)

#### ROUTES OF EXPOSURE

Not explicit.

## VARIABLES INCLUDED

### Pesticide Active Ingredient:

i) Physical-chemical and fate properties:

DT50soil (days; laboratory or field data)

Koc

BCF or Kow

ii) Toxicity:

environmental label statements, risk phrases (e.g., toxic to honey bees, toxic to aquatic organisms, other specific environmental risk phrases, etc.)

**Pesticide use:** National sales data (tons sold per year)

**Soil/site data:** not used

**Fate:** not used

## METHODS OR FORMULAE FOR COMBINING VARIABLES:

Environmental risk indicator =  $\sum_i(\text{tonnes\_a.i.}_i \times e\_tox_i)$

where:

tonnes\_a.i.<sub>i</sub> = tonnes of pesticide “i” (active ingredient) sold per year

e\_tox<sub>i</sub> = environmental index score for pesticide “i”

Criteria and Scores for Environmental Risk Index:

Toxic to honey bees = 1

or Very toxic to honey bees = 2

Toxic to aquatic organisms = 1

or Very toxic to aquatic organisms = 2

Other specific environmental risk phrases

(e.g., toxic to earthworms, dangerous to ozone layer, etc.) = 2

DT50soil (lab or field) > 70 days = 2

Koc < 150 = 2

BCF > 500 or Kow > 3 = 2

Maximum possible score per active ingredient = 12

## TOXICITY VARIABLES

Addition. Scores for environmental toxicity risk phrases for all organisms are summed as part of a total environmental risk index score.

**EXPOSURE VARIABLES**

Addition. Scores for all exposure variables are summed as part of a total environmental risk index score.

**TOXICITY AND EXPOSURE**

Addition. Scores for all exposure variables and environmental toxicity risk phrases are summed as part of a total environmental risk index score.

**RISK AND USE**

Use x Risk phrase score.

**AGGREGATION OF PESTICIDES AND CROPS**

Summed over all pesticides.

**USE OF SCORING**

Risk phrases score 1 or 2.

**TREATMENT OF MISSING DATA**

None missing (based on label phrases).

**HOW ARE THE RESULTS OF THE INDICATOR PRESENTED?** (give examples)

Indicator results are presented as graphs, with year on the x-axis and index score on the y-axis.

**LESSONS LEARNED FROM WORKING WITH INDICATORS:****obstacles to overcome, successful approaches, benefits and limitations of indicators**

To primarily base the indicators on easily accessible data has been advantageous from an administrative point of view. It has also been easier to communicate the output, particularly as the indicator results are presented in relation to pesticide consumption. The present indicators have met the need to measure progress in the ongoing national risk reduction programmes.

The risk indicator needs to be further developed and improved with the aim to approach a measurement on actual risk reduction. Exposure data seems to be the weakest link in the chain. The next step is, therefore, to include data on treatment intensity (rate and number of applications) and also to divide substances into different categories related to operator exposure.

It is important to ensure awareness of the intended use and the limitations of the indicators, including the following:

- i) Missing or poor quality data add to uncertainty.
- ii) Sales data are a poor measure of actual exposure.
- iii) Index-scoring is based on the classification and labelling of the corresponding products, and not actual data.
- iv) Indicators based on scoring cannot be validated.
- v) There may be significant metabolites which are ignored by this process.

**IMPORTANT REFERENCES:**

None stated.

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### INDICATOR NAME

Swedish Human Health Risk Indicator

### WHEN AND WHY WAS THE INDICATOR DEVELOPED?

The primary purpose of the nationally developed risk indicators has been as a policy tool, to be used to measure progress of the completed first two stages of the risk reduction programme. Currently, they are used as estimation tools when setting the goals for the succeeding stage of the programme, which will continue to the year 2001.

### HOW HAS THE INDICATOR BEEN USED?

To measure progress over time in the national risk reduction programme on pesticides.  
To communicate pesticide risk reduction in a simple manner to politicians and the public.

### DESCRIPTION OF THE INDICATOR:

#### TYPES OF RISK

Human Health

#### ROUTES OF EXPOSURE

Not explicit.

#### VARIABLES INCLUDED

**Pesticide Active Ingredient:**

i) Physicochemical and fate properties: not used

ii) Toxicity:

human health label statements, risk phrases (e.g., toxic, corrosive, irritant, etc.)

**Pesticide use:** National sales data (tons sold per year)

**Soil/site data:** not used

**Fate:** not used

**METHODS OR FORMULAE FOR COMBINING VARIABLES:**

Human health risk indicator =  $\sum_i(\text{tonnes\_a.i.}_i \times \text{h\_tox}_i)$

where:

tonnes\_a.i.<sub>i</sub> = tonnes of pesticide “i” (active ingredient) sold per year

h\_tox<sub>i</sub> = human health index score for pesticide “i”

Criteria and Scores for Human Health Risk Index (category of danger, score):

T+, very toxic = 10

T, toxic = 7

C, corrosive = 5

Xi, irritant = 4

Xn, harmful = 3

V, moderately harmful = 1

Active ingredients are scored by one of the criteria above.

Maximum possible score per active ingredient = 10

Active substances included in products labelled with certain risk phrases related to cancer and reprotoxicology will receive the maximum score (10), irrespective of which of the categories of danger to which they belong.

**TOXICITY VARIABLES**

One score is assigned for each active ingredient based on label statements.

**EXPOSURE VARIABLES**

Not explicit.

**TOXICITY AND EXPOSURE**

Not combined.

**RISK AND USE**

Use x Risk phrase score.

### **AGGREGATION OF PESTICIDES AND CROPS**

Summed over all pesticides.

### **USE OF SCORING**

Risk phrases score from 1 to 10.

### **TREATMENT OF MISSING DATA**

No data are missing as the indicator is based on label phrases.

### **HOW ARE THE RESULTS OF THE INDICATOR PRESENTED?** (give examples)

Indicator results are presented as graphs, with the year on the x-axis and the indicator value (summed for all pesticides) on the y-axis.

### **LESSONS LEARNED FROM WORKING WITH INDICATORS: obstacles to overcome, successful approaches, benefits and limitations of indicators**

To primarily base the indicators on easily accessible data has been advantageous from an administrative point of view. It has also been easier to communicate the output, particularly as the indicator results are presented in relation to pesticide consumption. The present indicators have met the need to measure progress in the ongoing national risk reduction programmes.

The risk indicator needs to be further developed and improved with the aim to approach a measurement on actual risk reduction. Exposure data seems to be the weakest link in the chain. The next step is, therefore, to include data on treatment intensity (rate and number of applications) and also to divide substances into different categories related to operator exposure.

It is important to ensure awareness of the intended use and the limitations of the indicators, including the following:

- i) Missing or poor quality data add to uncertainty.
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