

GENERIC RISK ASSESSMENT MODEL FOR INDOOR RESIDUAL SPRAYING OF INSECTICIDES

SECOND EDITION



**World Health
Organization**

Generic risk assessment model for indoor residual spraying of insecticides

2nd Edition



World Health Organization
Communicable Diseases cluster
Department of Control of Neglected Tropical Diseases
Vector Ecology and Management
&
Climate and Other Determinants of Health cluster
Department of Public Health, Environmental and Social Determinants of Health
International Programme on Chemical Safety

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Terminology, abbreviations and acronyms

ADI	acceptable daily intake
a.i.	active ingredient
ARfD	acute reference dose
ATSDR	United States Agency for Toxic Substances and Disease Registry
AUC	area under curve
BCF	bioconcentration factor
BMD	benchmark dose
CICAD	Concise International Chemical Assessment Document
EC	European Commission
EFSA	European Food Safety Authority
EHC	Environmental Health Criteria
EU	European Union
EUROPOEM	European Predictive Operator Exposure Model
GHS	Globally Harmonized System of Classification and Labelling of Chemicals (United Nations, 2015)
GLP	good laboratory practice
guideline scenario	the insecticide is used according to the instructions given on the product label and in WHO guideline information
IARC	International Agency for Research on Cancer
IPCS	International Programme on Chemical Safety
JECFA	Joint FAO/WHO Expert Committee on Food Additives
JMPM	Joint FAO/WHO Meeting on Pesticide Management
JMPR	Joint FAO/WHO Meeting on Pesticide Residues
lax standard scenario	no personal protective equipment other than light clothing covering the trunk is assumed
LOAEL	lowest-observed-adverse-effect-level
MRL	minimal risk level
NOAEL	no-observed-adverse-effect-level
OECD	Organisation for Economic Co-operation and Development
OEL	occupational exposure limit
POEM	Predictive Operator Exposure Model
PPE	personal protective equipment
PSD	Pesticides Safety Directorate of the United Kingdom Health and Safety Executive
RfC	reference concentration
RfD	reference dose
RPE	respiratory protective equipment
TSD	tolerable systemic dose
TSD _{AC}	Tolerable systemic dose, acute exposure
TWA	time-weighted average
UF	uncertainty factor
USEPA	United States Environmental Protection Agency
WHO	World Health Organization
WHOPES	World Health Organization Pesticide Evaluation Scheme

Indoor residual spraying (IRS) is the application of insecticides on the inside walls of dwellings in order to kill target insects that come into contact with the treated surface. Such insecticidal deposits are intended to remain active for an extended period of time. Indoor residual spraying is widely used to control the vectors of malaria, Chagas disease and visceral leishmaniasis.

The formulations commonly used for indoor residual application of insecticides are wettable powders, suspension concentrates, capsule suspensions and water-dispersible granules. Wettable powders or water dispersible granules in sealed water soluble bags are also formulated and provide ease of handling and mixing in a spray tank and reduce spray operators' risk (WHO, 2007). Emulsifiable concentrates are generally not suitable for use in indoor residual spraying.

2. Purpose

- those preparing the spray;
- those applying the spray;
- residents living in the treated houses; and
- residents who participate in preparing and applying insecticides.

The structure of this document follows that of A generic risk assessment model for

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