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OECD SURVEY ON INTEGRATED PEST MANAGEMENT (IPM) IN THE FIELD OF PRIVATE AREA AND PUBLIC HEALTH AREA DISINFECTANTS

Series on Biocides
No. 12

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OECD SURVEY ON INTEGRATED PEST MANAGEMENT (IPM) IN THE FIELD OF PRIVATE AREA AND PUBLIC HEALTH AREA DISINFECTANTS

IOMC
INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS
A cooperative agreement among FAO, ILO, UNDP, UNEP, UNIDO, UNITAR, WHO, World Bank and OECD

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FOREWORD

The initial discussions on risk reduction and biocides in the Task Force on Biocides (TFB) originate from 2008, when it was decided to perform a first survey on available risk reduction measures in OECD countries. The outcome of the survey, performed in 2010-2011, indicated that, even though general risk reduction measures were in place in several member countries, there was no harmonised approach between countries and that further work on more specific areas of biocide risk reduction would be valuable.

Countries responding to the 2010-2011 survey made a number of suggestions for new activities that could be carried-out at the OECD level and that would help achieve further progress in biocide risk reduction. Therefore the TFB decided to initiate more specific activities dealing with biocide risk reduction, and to initially focus on Integrated Pest Management (IPM) for biocides.

The TFB agreed to start exploring this area with a survey limited to one biocide type: private area and public health area disinfectants for professional use, equivalent to Product Type 2 (PT2) in the European Union (EU). This survey was conducted in 2015 and its results are presented in this document.

This document is published under the responsibility of the Joint Meeting of the Chemicals Committee and Working Party on Chemicals, Pesticides and Biotechnology.

OECD SURVEY REPORT ON INTEGRATED PEST MANAGEMENT (IPM) IN THE FIELD OF PRIVATE AREA AND PUBLIC HEALTH AREA DISINFECTANTS

INTRODUCTION

1. The initial discussions on risk reduction and biocides originate from the 6th meeting of the Task Force on Biocides (TFB) in 2008, where it was decided to perform a first survey on available risk reduction measures in OECD countries. The survey was performed in 2010-2011 and its outcome indicated that, even though general risk reduction measures were in place in several member countries, there was no harmonised approach between countries and that further work on more specific areas of biocide risk reduction would be valuable.

2. Countries responding to the 2010-2011 survey made a number of suggestions for new activities that could be carried-out at the OECD level and that would help achieve further progress in biocide risk reduction. More specifically, in the area of "sustainable use of biocides", the following suggestions were made:

- Set up criteria for evaluating the sustainable use of biocides
- Review the roles of biocides in a sustainable hygienic society: how do biocides contribute to a sustainable society? What would be the necessary number of products to achieve hygiene, and to prevent resistance? And what costs and benefits should be weighed when it comes to reducing risks?
- Increase knowledge and data in the field of resistance development due to the (incorrect) use of biocides, i.e. disinfectants, antimycotics, rodenticides, insecticides
- Study the costs and benefits of using or not using biocides
- Consider substitution options: look for biocides which do not hold risks for human health or the environment and for alternatives
- Develop risk indicators, in particular to measure risk reduction

3. Therefore, as a follow-up, the TFB decided to initiate more specific activities dealing with biocide risk reduction, and to focus on Integrated Pest Management (IPM). It agreed to start exploring this area with a survey limited to one biocide type: private area and public health area disinfectants for professional use, equivalent to Product Type 2 (PT2) in the European Union (EU).

IPM for biocides (disinfectants)

4. As suggested by the OECD survey carried out in 2010-2011, IPM can contribute to biocide risk reduction and is to be seen as a strategy to promote and encourage a safer and more sustainable use of biocides. While IPM is a widely used concept in agricultural settings, it is less developed and used in non-agricultural contexts. However, it is worth noting that IPM as such is referred to in the European Biocidal Products Regulation (BPR) 528/2012, Article 18 on "Measures geared to the sustainable use of biocidal products" whereby the European Commission shall submit to the European Parliament and the Council a

report examining inter alia *"(c) the development and application of integrated pest management principles with respect to the use of biocidal products"*.

5. As for IPM in agriculture, IPM for biocides is an approach that could combine a variety of methods to control "pests" rather than relying on chemical products alone; in the case of disinfectants, "pests" (and harmful micro-organisms) include bacteria, virus, fungi, spores, etc. Alternative methods may range from using preventive measures, adopting biological techniques, improving user knowledge, improving technology and equipment, etc. In this respect, IPM is not just a set of techniques put together but a range of options to be adopted on a case-by-case basis. In addition, IPM aims at balancing environmental, sustainable and economic concerns, taking into account health and environmental safety.

Objectives of the survey

6. The primary objective of the survey was to make an inventory of OECD wide available IPM measures, focussing on the specific criteria used for IPM, IPM actions already taken in member countries and the different types of monitoring carried out, as they relate to products used as private area and public health area disinfectants.

7. Further to collecting data from countries and promoting information exchange about existing IPM activities, additional medium and longer term objectives were also envisaged such as:

1. Developing a harmonised approach to IPM measures for biocides

2. Developing harmonised criteria and principles for IPM as far as private area and public health area disinfectants are concerned

Scope of the survey

8. As agreed by the TFB, this OECD survey focused on **biocides used as private area and public health area disinfectants**, equivalent to PT2 as defined in the EU (cf. Annex V of EU BPR 528/2012). It covered disinfectants and algaecides not intended for direct application to humans or animals, which are used in private and in public health areas. In addition, as recommended by the 12th TFB meeting, the survey further focused on **professional uses**.

9. As such disinfectants cover very diverse application and use areas, it was anticipated that IPM measures would differ according to the different products and uses. Therefore in order to collect relevant and specific data, some questions of the survey listed the products covered in the survey.

10. For the purpose of the survey, the following products were thus covered:

1. **Disinfectants for surfaces** (e.g. rooms, furniture, lavatories and objects) **in private homes** (used by professional operators and used for real sanitary purpose and not just hygienic ones)

2. **Disinfectants for surfaces** (e.g. rooms, furniture, lavatories and objects) **in public areas** (in the medical sector or in other institutions such as schools, shops, transports, hotels, offices)

3. **Disinfectants for medical equipment, instruments or devices**[1]

4. **Disinfectants for laundries**

5. **Disinfectants for air conditioning systems**

6. **Disinfectants for chemical toilets**

7. **Disinfectants and algaecides for swimming pools, bathing and other waters**

8. **Disinfectants and algaecides for aquariums**

9. **Disinfectants for wastewater and hospital waste** (in order to prevent infection)

10. **Disinfectants for industrial areas** (e.g. premises dealing with packaging material, production of pharmaceuticals/cosmetics/toiletries and production of computers)

11. **Disinfectants for soil and other substrates** (e.g. in playgrounds – but not for agricultural soils)

12. **Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties**.

13. **Other products** (to be specified)

The survey questionnaire can be found in Annex 1 of this report.

[1] It has to be noted that in the EU, the disinfectants used for this purpose are not considered biocides, but are medical devices themselves. And they would fall under the Medical Device Directive (93/42/EEC).

SURVEY RESULTS

Survey responses

11. **Austria, Canada, Finland, Germany, the Netherlands** and **Spain** responded to the survey. The Secretariat additionally tried to contact specific countries; i.e. those countries that had responded to the above mentioned 2010-2011 OECD survey and/or EU countries that have been or still are evaluating PT2 substances under the European Biocidal Products Regulation (528/2012), to get more responses. However, for various reasons, the majority of those countries indicated that they would not reply to the survey. In addition, it has to be noted that the Canadian response only covers swimming pool chemicals and that the Dutch response is limited to the field of healthcare."

12. The next pages provide an analysis of the six country responses, which is organized in four main parts according to the order of the questions in the survey, and followed by the comments made during discussion of the survey results during the 13th TFB meeting:

Part A. General
Although the objective of the survey was not to harmonise IPM definition for biocides and disinfectants, this part aimed at collecting existing definitions to better understand the countries' various approaches.

Part B. Principles and criteria used for IPM and disinfectants
Part B explored the concept of IPM with disinfectants and whether the 8 IPM principles applied in agriculture could be extrapolated and made relevant for biocides/disinfectants.

Part C. IPM actions already taken in Member countries and organisations
This part requested countries to report on actual, existing IPM activities.

Part D. Monitoring IPM projects and successes
Countries were invited to report on how they monitored and measured the adoption and implementation of IPM, and where relevant, what kind of indicators they were using to measure progress in adoption and implementation of IPM?

13. A full compilation of the country responses to each question can be found in Annex 2.

Survey analysis

Part A. General

Questions 1 & 2 (IPM definitions)

- Only Spain reported having a definition of IPM for biocides/disinfectants (as part of the Spanish Standard for indoor environmental quality – UNE 171210). It reads:

  "*Strategy aimed at keeping the population of potentially harmful species below the tolerance threshold that prioritizes, integrates and combines environmental management measures minimizing the use of biocides*".
- Austria also indicated that IPM related to pest control was defined in the US as it relates to school settings.

Part B. Principles and criteria used for IPM and disinfectants

Questions 3 to 10 refer to the 8 IPM principles applied in agriculture (as described in Annex III of EU Directive 2009/128/EC). For the purpose of the survey they have been adapted to biocides as follows:

Principle	**Summary of the principle (already adapted to some extent to biocides)**
Principle 1 **Prevention**	Prevention and/or suppression of harmful micro-organisms via, e.g., hygiene measures, enhancement of beneficial organisms, improvement of equipment performance.
Principle 2 **Monitoring**	Monitoring harmful micro-organisms by adequate methods and tools such as e.g., observations, warning systems, forecasting, and early diagnosis systems.
Principle 3 **Decision-making**	Based on the results of monitoring and making use of scientifically sound threshold values, decide whether and when to apply control measures.
Principle 4 **Non-chemical**	Non-chemical products and measures shall be prioritized.
Principle 5 **Specific biocides**	The biocides applied shall be as specific as possible for the target micro-organisms and have the least side effects on human health, non-target organisms, and the environment.
Principle 6 **Necessary levels**	Keep the use of biocides and other interventions at necessary levels.
Principle 7 **Anti-resistance**	Available anti-resistance strategies shall be applied to maintain the effectiveness of the products.
Principle 8 **Check success**	Based on the records and monitoring of biocide usage and harmful micro-organisms, check the success of the control measures.

Question 3 (IPM principles - general)

- Generally speaking responding countries replied that the 8 IPM principles used in agriculture would be applicable to biocides/disinfectants. Only Canada indicated some reservations.
- The EU (responding) countries indicated that the principles were important and rated them as:

  - Medium-High important: for Principles 1, 2, 3, 4 and 8
  - High important: for Principles 5, 6 and 7
- Canada replied that the all principles but Principle 6 (Medium) were of Low importance.
- However, in order to be fully relevant to disinfectants, the amended principles (as suggested by the survey text – cf. in the above table) would need further amending and adapting.

Questions 4 to 10 (IPM principles - details)

- Countries provided extensive lists of measures, strategies, criteria, etc. that relate to each of the IPM principles, for each type of disinfectants. Below are summarised for each principle the main measures or criteria that were provided by responding countries (for all types of disinfectants together).

Principle 1 **Prevention**	**Describe preventive measures to be recommended / implemented before any disinfectant is being used:** • Cleaning: with water and soap/detergent, i.e. non-biocidal chemicals, steam or dry heat, irradiation, high temperature, microwave (for hospital waste) • Maintaining overall cleanliness. In general, disinfectants are not needed in households • Sterile storage of equipment/instruments (for medical settings) • Bleaching (for laundries) • Washing (for textiles and materials – rather than incorporating disinfectants) • Hygiene measures and plans: regular maintenance • Taking shower (for public swimming pools); using sand filters and manual cleaning (for private swimming pools) • Public awareness campaigns • Public educational work; training of the workers • Special design e.g. avoid areas of stagnant water, temperature control (against Legionella) Note: in Austria, IPM is not applicable to health care institutions
Principle 2 **Monitoring**	**Describe monitoring/diagnosis tools for harmful micro-organism:** • Regular sampling and laboratory analysis of microorganisms (using reliable and specific laboratory tests for early diagnosis) • Clinical surveillance • Visual observation (for swimming pools) • Monitoring: only as control for the efficacy of the disinfection process
Principle 3 **Decision-making**	**Describe decision-making criteria and scientific threshold values that would (or would not) trigger the use of disinfectants:** • Persons with infectious diseases at home • Occurrence of an infectious disease in schools • Smell (for air conditioning systems or chemical toilets) • Water colour (for aquariums and swimming pools) • Cleanliness of the glass (for aquariums) • Legally defined threshold values for water quality (for swimming pools)

Principle 4 **Non-chemical**	**Describe non-chemical products (e.g. alternatives, substitution), measures and processes to be used instead of, or in complement of, disinfectants:** • Cleaning: steam, normal detergents, bleaching, high temperature (> 90°C) • Filtering • Heat sterilisation, steam disinfection, autoclaving (for medical settings) • Microwaves (for medical waste) • Hygiene measures • Regular maintenance • Taking shower (for public swimming pools); using sand filters and manual cleaning (for private swimming pools) • Normal washing (for textiles– rather than incorporating disinfectants) • Public awareness campaigns • Public educational work; training of the workers
Principle 5 **Specific biocides**	**Describe how biocides are specific to harmful micro-organisms:** • In general: depends on the mode of action of the active substance / product. • Specific test methods for different efficacy claims shall be used: bactericidal, levurocidal, fungicidal, virucidal, sporicidal, mycobactericidal. The efficacy against the specific groups of organisms shall be claimed in the product information. • Requirements given by EN, EU draft guidance on efficacy of disinfectants (under finalisation)
Principle 6 **Necessary levels**	**Describe how biocides are (or should be) used at necessary levels (e.g. dosages, frequency) on harmful micro-organisms:** • The use of biocides at an efficacious level is decided during the authorisation procedure of the individual products according to the EU guidance document for disinfectants (determining the dosage and instructions for use on the label) • Products should always be used according to the label instructions to ensure proper use, to avoid overdosing and underdosing (possibility of resistance development). • Disinfectants shall be used accordingly to the product information on efficacy and dosages respectively (dosage, user category, RMMs-ECHA's etc. and to codes of best practice). Basis of the use conditions have to be tested accordingly to European standards or general accepted national test methods. In Germany, lists of disinfectants with proven efficacy (by independent experts) are published by the "Verbund für Angewandte Hygiene" (VAH-List) and the Robert Koch-Institute (RKI) especially for the medical area. • In the context of swimming pool disinfectants: o the use of specific/prescriptive levels of biocides already exist and necessary interventions are already in place in case of contamination. o In-line monitoring of the baseline concentration of the disinfectant

Principle 7 **Anti-resistance**	**Describe possible anti-resistance strategies as far as disinfectants are concerned:** • Correct and prescribed use conditions should be met (correct concentration, prevention of over- and under-dosing, time, temperature, no mix with other disinfectants or cleaners, and use only when absolutely necessary) • In Germany for the medical area, there are recommendations by authorized commissions, scientific societies on performance of disinfection measures, e.g. recommendations from the "Commission for Hospital Hygiene and Infection Prevention" for preparation of medical products and for surface disinfection in the medical area. These recommendations provide general measures for the proper performing of disinfection • Avoid the use of disinfectants • Disinfectants in private households are not needed under normal conditions • Alternate disinfectants with molecules differing in mode of action • Use as much as possible of physical disinfection processes (autoclaving,..) • Steam disinfection • No use at too low dosage

Part C. IPM actions already taken in Member countries and organisations

Questions 11 to 15 (activities and guidelines)

- Finland and Spain (and Germany) reported about some national initiatives related to IPM for biocides as they relate to the sustainable use of biocides
  - In Finland: work is underway for other types of biocides: wood preservatives, antifouling products, rodenticides, insecticides. They are recommended to be used only when needed.
  - In Germany: there are efforts to develop mandatory codes of best practice for a sustainable use of biocides/disinfectants following the PPP area. Furthermore the Federal Environment Agency runs a website (www.biozid.info) to provide information to the public, where and when the use of biocides/disinfectants is indicated and which measures pose an alternative for the use of these substances (in German).
  - Spain has referred to the development of standards (e.g. like the existing UNE 171210), that are in preparation for best practices of disinfection for installations which can spread Legionella
- No country was aware of IPM activities in other countries.
- Only the Netherlands provided an example of a successful project: the WIP guideline on the prevention of infections in healthcare institutions.
- With respect to IPM guidelines, Germany referred to some related documents:
  - Biocides: Proposal for a concerted European approach towards a sustainable use by the Federal Environment Agency in December 2014 (The measures that are included are not disinfectant-specific, but some of these general measures are also applicable for a disinfectant-specific IPM)
  - Transitional Guidance on Evaluation of Environmental RMM (risk mitigation measures) for Disinfectants in PT 1-5 prepared by ECHA on 13/11/2014
  - Guidance documents on the targeted and efficient use of disinfectants published by the German industrial association for hygiene and surface protection (IHO) (in German)
- Spain mentioned its Standard UNE 171210 (Indoor Environmental Quality. Good practice for disinfection, insect and rat control plans).

Questions 16 and 17 (drivers and barriers)

- Regarding the main drivers for promoting IPM for disinfectants and the possible approaches supportive to IPM adoption and implementation, responding countries listed among others: costs (and better use of money), sustainability, reducing resistance, reducing risks, having proper guidelines, inventorying existing IPM-like initiatives, the Administration and the sector associations.
- Regarding the main barriers to the adoption and implementation of IPM for disinfectants, countries indicated inter alia: the lack of clear criteria, of feasibility studies, of guidance, of knowledge/information, untrained professionals

Question 18

- Germany and Spain replied positively to the question about the regulatory need for IPM for biocides/disinfectants.

Part D. Monitoring IPM projects and successes

Questions 19 & 20

- No country reported monitoring and measuring the adoption and implementation of IPM as far as disinfectants are concerned. Only Spain indicated monitoring the compliance with the legislation.
- Therefore no specific indicators were indicated.

COMMENTS MADE DURING 13th TFB MEETING

14. The participants of 13th TFB meeting in September 2015 discussed the outcomes of the survey.

15. They first acknowledged the fact that the term "IPM", originating from an agricultural context, was not broadly recognised in the biocide sector; and therefore countries had difficulties getting comprehensive responses to the survey. Some respondents even indicated that their colleagues had difficulties understanding the concept of IPM for biocides and that their knowledge and experience were generally limited. More generally, governments realised that for the public, the term "biocides" is not meaningful to most people while "disinfection agent" or "conservation agent" is.

16. However, at the meeting, industry and some country representatives stressed that in fact many industries, e.g. the agri-food industry, had IPM techniques in place, though these techniques were not necessarily called IPM-techniques. In general, industry rather refers to the concept of "sustainable use of biocides" which is more commonly used and already integrated in some policies.

17. In addition, the survey responses showed that the eight IPM principles, adopted for agriculture were considered important by most responding countries. These principles were broadly acceptable for disinfectants, although some adaptations would be needed. More interestingly, as confirmed by some meeting participants, most eight principles were in fact already applied, to some extent, by countries and the industry, although not officially labelled as "IPM".

18. Finally, some countries noted that the survey scope turned out to be too broad with twelve disinfectant diverse categories, and recommended more targeted follow-up activities.

Next steps and possible follow-up activities

19. The participants of 13th TFB meeting then discussed how the area of IPM for biocides should be pursued at the TFB level. In view of the survey outcomes and of the above comments, they suggested a number of potential projects:

- promote and explain IPM (or whatever term more appropriate) for biocides through awareness raising and communication campaigns
- survey or collect industry about their "IPM-techniques"
- address the issue of biocide residues and degradation products in the food prepared in the food/feed industry
- extend the survey initiative to cover IPM and sustainable use in the private area
- address labelling and information on proper use of biocides
- develop best practices or simple messages linked to the IPM principles in a clear and accessible language for the end-use consumers (not necessarily through the product labels but on separate leaflets)
- develop overarching principles for (some) disinfectants or for more biocides

ANNEX 1

QUESTIONNAIRE

Your country/organisation:……

Part A - General

Although the objective of the survey is not to harmonise IPM definition for biocides and disinfectants, the OECD would like to collect existing definitions to better understand the countries' various approaches.

Question 1. Does your country/organisation use a definition of IPM for biocides/disinfectants?
Yes/No

If so, please specify by providing text and reference/web link.

Question 2. Are you aware of existing definitions of IPM for biocides/disinfectants (in other countries and organisations)?
Yes/No

If so, please specify by providing text and reference/web link.

Part B. Principles and criteria used for IPM and disinfectants

Part B is exploring the concept of IPM with disinfectants, while Part C will ask you to report on actual, existing IPM activities.
Therefore, following the completion of the Table in question 3 below, questions 4 to 10 will give you the opportunity to elaborate on the principle/criteria in general (and not necessarily what is being done in your country/organisation).

Question 3. Could the 8 IPM principles (as described in Annex III of EU Directive 2009/128/EC) applied in agriculture be extrapolated and made relevant for biocides/disinfectants? *(please complete columns 3a., 3b. and 3c.)*

Principle	**Summary of the principle (already adapted to some extent to biocides)**	**3a. Is this principle applicable to biocides/disinfectants?** *Yes/Possibly/No*	**3b. Is your country/organisation considering this principle important? Please rate.** *High (H) / Medium (M) / Low (L)*	**3c. Please comment (e.g. amend principle to better fit biocide uses and add specific criteria relevant for disinfectants)**	**Further questions**
Principle 1 (Prevention)	Prevention and/or suppression of harmful micro-organisms via, e.g., hygiene measures, enhancement of beneficial organisms, improvement of equipment performance.				Describe preventive measures (see question 4 below)
Principle 2 (Monitoring)	Monitoring harmful micro-organisms by adequate methods and tools such as e.g., observations, warning systems, forecasting, and early diagnosis systems.				Describe monitoring/diagnosis tools (see question 5 below)

Principle	**Summary of the principle (already adapted to some extent to biocides)**	**3a. Is this principle applicable to biocides/disinfectants?** *Yes/Possibly/No*	**3b. Is your country/organisation considering this principle important? Please rate.** *High (H) / Medium (M) / Low (L)*	**3c. Please comment (e.g. amend principle to better fit biocide uses and add specific criteria relevant for disinfectants)**	**Further questions**
Principle 3 (Decision-making)	Based on the results of monitoring and making use of scientifically sound threshold values, decide whether and when to apply control measures.				Describe decision making criteria and scientific threshold values (see question 6 below)
Principle 4 (Non-chemical)	Non-chemical products and measures shall be prioritized.				Describe non-chemical products, measures/processes (see question 7 below)
Principle 5 (Specific biocides)	The biocides applied shall be as specific as possible for the target micro-organisms and have the least side effects on human health, non-target organisms, and the environment.				Describe how biocides are specific (see question 8 below)
Principle 6 (Necessary levels)	Keep the use of biocides and other interventions at necessary levels.				Describe how biocides are used at necessary levels (see question 9 below)
Principle 7 (Anti-resistance)	Available anti-resistance strategies shall be applied to maintain the effectiveness of the products.				Describe anti-resistance strategies for disinfectants (see question 10 below)

Principle	**Summary of the principle (already adapted to some extent to biocides)**	**3a. Is this principle applicable to biocides/disinfectants?** *Yes/Possibly/No*	**3b. Is your country/organisation considering this principle important? Please rate.** *High (H) / Medium (M) / Low (L)*	**3c. Please comment (e.g. amend principle to better fit biocide uses and add specific criteria relevant for disinfectants)**	**Further questions**
Principle 8 (Check success)	Based on the records and monitoring of biocide usage and harmful micro-organisms, check the success of the control measures.				Describe ways to measure IPM adoption and impact for biocides (see questions 19 & 20 in Part D below)

In the following questions 4 to 10 and questions 19-20, each above principle is reviewed in more detail, for each type of disinfectants.

Question 4. Principle 1: Prevention

Type of disinfectant (used by professional operators)	Describe preventive measures to be recommended / implemented before any disinfectant is being used (you may list several measures per type of disinfectant - or none if N/A)
1. Disinfectants for surfaces in private homes	
2. Disinfectants for surfaces in public areas	
3. Disinfectants for medical equipment, instruments and devices	
4. Disinfectants for laundries	
5. Disinfectants for air conditioning systems	
6. Disinfectants for chemical toilets	
7. Disinfectants and algaecides for swimming pools, bathing and other waters	
8. Disinfectants and algaecides for aquariums	
9. Disinfectants for wastewater and hospital waste	
10. Disinfectants for industrial areas	
11. Disinfectants for soil and other substrates	
12. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
13. Other products (to be specified)	

<u>Question 5.</u> Principle 2: Monitoring

Type of disinfectant (used by professional operators)	Describe monitoring/diagnosis tools for harmful micro-organisms (you may list several tools per type of disinfectant - or none if N/A)
• Disinfectants for surfaces in private homes	
• Disinfectants for surfaces in public areas	
• Disinfectants for medical equipment, instruments and devices	
• Disinfectants for laundries	
• Disinfectants for air conditioning systems	
• Disinfectants for chemical toilets	
• Disinfectants and algaecides for swimming pools, bathing and other waters	
• Disinfectants and algaecides for aquariums	
• Disinfectants for wastewater and hospital waste	
• Disinfectants for industrial areas	
• Disinfectants for soil and other substrates	
• Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
• Other products (to be specified)	

<u>Question 6.</u> Principle 3: Decision-Making

Type of disinfectant (used by professional operators)	Describe decision-making criteria and scientific threshold values that would (or would not) trigger the use of disinfectants (you may list several criteria per type of disinfectants - or none if N/A)
1. Disinfectants for surfaces in private homes	
2. Disinfectants for surfaces in public areas	
3. Disinfectants for medical equipment, instruments and devices	
4. Disinfectants for laundries	
5. Disinfectants for air conditioning systems	
6. Disinfectants for chemical toilets	
7. Disinfectants and algaecides for swimming pools, bathing and other waters	
8. Disinfectants and algaecides for aquariums	
9. Disinfectants for wastewater and hospital waste	
10. Disinfectants for industrial areas	
11. Disinfectants for soil and other substrates	
12. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
13. Other products (to be specified)	

<u>Question 7.</u> Principle 4: Non-chemical

Type of disinfectant (used by professional operators)	Describe non-chemical products (e.g. alternatives, substitution), measures and processes to be used instead of, or in complement of, disinfectants (you may list several measures per type of disinfectant - or none if N/A)
1. Disinfectants for surfaces in private homes	
2. Disinfectants for surfaces in public areas	
3. Disinfectants for medical equipment, instruments and devices	
4. Disinfectants for laundries	
5. Disinfectants for air conditioning systems	
6. Disinfectants for chemical toilets	
7. Disinfectants and algaecides for swimming pools, bathing and other waters	
8. Disinfectants and algaecides for aquariums	
9. Disinfectants for wastewater and hospital waste	
10. Disinfectants for industrial areas	
11. Disinfectants for soil and other substrates	
12. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
13. Other products (to be specified)	

<u>Question 8.</u> Principle 5: Specific biocides

Type of disinfectant (used by professional operators)	Describe how biocides are specific to harmful micro-organisms
1. Disinfectants for surfaces in private homes	
2. Disinfectants for surfaces in public areas	
3. Disinfectants for medical equipment, instruments and devices	
4. Disinfectants for laundries	
5. Disinfectants for air conditioning systems	
6. Disinfectants for chemical toilets	
7. Disinfectants and algaecides for swimming pools, bathing and other waters	
8. Disinfectants and algaecides for aquariums	
9. Disinfectants for wastewater and hospital waste	
10. Disinfectants for industrial areas	
11. Disinfectants for soil and other substrates	
12. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
13. Other products (to be specified)	

<u>Question 9.</u> Principle 6: Necessary levels

Type of disinfectant (used by professional operators)	Describe how biocides are (or should be) used at necessary levels (e.g. dosages, frequency) on harmful micro-organisms
• Disinfectants for surfaces in private homes	
• Disinfectants for surfaces in public areas	
• Disinfectants for medical equipment, instruments and devices	
• Disinfectants for laundries	
• Disinfectants for air conditioning systems	
• Disinfectants for chemical toilets	
• Disinfectants and algaecides for swimming pools, bathing and other waters	
• Disinfectants and algaecides for aquariums	
• Disinfectants for wastewater and hospital waste	
• Disinfectants for industrial areas	
• Disinfectants for soil and other substrates	
• Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
• Other products (to be specified)	

Question 10. Principle 7: Anti-resistance

Type of disinfectant (used by professional operators)	Describe possible anti-resistance strategies as far as disinfectants are concerned
• Disinfectants for surfaces in private homes	
• Disinfectants for surfaces in public areas	
• Disinfectants for medical equipment, instruments and devices	
• Disinfectants for laundries	
• Disinfectants for air conditioning systems	
• Disinfectants for chemical toilets	
• Disinfectants and algaecides for swimming pools, bathing and other waters	
• Disinfectants and algaecides for aquariums	
• Disinfectants for wastewater and hospital waste	
• Disinfectants for industrial areas	
• Disinfectants for soil and other substrates	
• Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
• Other products (to be specified)	

Part C. IPM actions already taken in Member countries and organisations

<u>Question 11.</u> Is or has your country/organisation been involved in any IPM activities for biocides/disinfectants at the national/regional/international level?
Yes/No

If so, please list them briefly and for each, indicate in ( ) whether this is at national/regional/international level. Also, if possible provide reference/web link.

<u>Question 12.</u> Are you aware of any other IPM activities for biocides/disinfectants (in other countries, in other organisations)*?*
Yes/No

If so, please briefly list them and if possible provide reference/web link.

<u>Question 13.</u> Could you describe the 3 most successful IPM actions and projects *in your country/organisation*, as they relate to disinfectants?

For each project, please indicate

Title of the project	
Type of disinfectant involved	
Year project undertaken	
Briefly describe the project and its main elements	
Who was involved in the project?	
Why this project was successful?	

<u>Question 14.</u> Could you describe the 3 most unsuccessful IPM actions and projects *in your country/organisation*, as they relate to disinfectants?

For each project, please indicate

Title of the project	
Type of disinfectant involved	
Year project undertaken	
Briefly describe the project and its main elements	
Who was involved in the project?	
Why this project was not successful?	

<u>Question 15.</u> Are disinfectant-specific IPM guidelines available and used in your country/organisation? If so, are they available as stand-alone documents or as part of best practice documents?
Please list, describe briefly the IPM part and provide reference/web link.

<u>Question 16.</u> In your view and given your country/organisation's experience with biocidal products, what are the main drivers for promoting IPM for disinfectants and the possible approaches you consider supportive to IPM adoption and implementation?

<u>Question 17.</u> In your view and given your country/organisation's experience with biocidal products, what are the main barriers to the adoption and implementation of IPM for disinfectants? What needs to be done to remove these?

<u>Question 18.</u> Does your country/organisation have a regulatory need for IPM for biocides/disinfectants?
Yes/No

If so, please describe this (these) need(s).

D. Monitoring IPM projects and successes

<u>Question 19.</u> Does your country/organisation monitor and measure the adoption and implementation of IPM as far as disinfectants are concerned?
Yes/No

<u>Question 20a.</u> If so, could you describe the types of monitoring in place in your country/organisation to follow IPM adoption and impact?

<u>Question 20b.</u> In particular, does your country/organisation use *indicators* to measure progress in adoption and implementation of IPM?
Yes/No

If yes, please specify or provide references. And please briefly describe these indicators, how they were chosen, and/or provide links to relevant information.

For above questions 20a and 20b, you may refer to the list of different disinfectants as necessary.

Type of disinfectant (used by professional operators)	Describe IPM monitoring for disinfectants
1. Disinfectants for surfaces in private homes	
2. Disinfectants for surfaces in public areas	
3. Disinfectants for medical equipment, instruments and devices	
4. Disinfectants for laundries	
5. Disinfectants for air conditioning systems	
6. Disinfectants for chemical toilets	
7. Disinfectants and algaecides for swimming pools, bathing and other waters	
8. Disinfectants and algaecides for aquariums	

Type of disinfectant (used by professional operators)	Describe IPM monitoring for disinfectants
9. Disinfectants for wastewater and hospital waste	
10. Disinfectants for industrial areas	
11. Disinfectants for soil and other substrates	
12. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
13. Other products (to be specified)	

More comments?

If you would like to provide more information, please feel free to make any other comments below (or to be attached).

Contact details of the person who has answered to the questionnaire:

Country/organisation	
Name (Ms./Mr.)	
Organisation/Ministry/Agency:	
Address:	
Email:	
Phone number:	

THANK YOU!

ANNEX 2

COMPILATION OF RESPONSES RECEIVED TO THE OECD QUESTIONNAIRE

ON INTEGRATED PEST MANAGEMENT (IPM)

IN THE FIELD OF PRIVATE AREA AND PUBLIC HEALTH AREA DISINFECTANTS

Part A - General

Question 1. Does your country/organisation use a definition of IPM for biocides/disinfectants?

Country	Yes	No	Comments
AUSTRIA		√	Presently the Austrian Competent Authority for biocides does not use a definition of IPM for the utilization of biocidal products, e.g. disinfectants. A request at the Federal Ministry of Health gave the same result - IPM in health care systems was seen very critically in general *[comment: "critically" in what sense??]*
CANADA		√	
FINLAND		√	
GERMANY		√	No, not specific for biocides/disinfectants, only from the PPP area
NETHERLANDS		√	

Country	Yes	No	Comments
SPAIN	√		Definition: "Estrategia, dirigida a mantener la población de especies potencialmente nocivas por debajo del umbral de tolerancia que prioriza, integra y combina medidas de gestión ambiental minimizando el uso de biocidas" (*Strategy aimed at keeping the population of potentially harmful species below the tolerance threshold that prioritizes, integrates and combines environmental management measures minimizing the use of biocides)* This definition is in standard UNE 171210: Calidad Ambiental en interiores. Buenas prácticas en los planes de Desinfección, Desinsectación y Desratización. *(UNE 171210: Indoor Environmental Quality. Good practice for disinfection, insect and rat control plans*.) http://www.aenor.es/aenor/normas/ctn/fichactn.asp?codigonorm=AEN/CTN 171&pagina=1 This standard has to be taken into account mandatorily by the professionals using disinfectants, according to the legislation on plagues control (disinfection, rats and insect control) trained professional (Real Decreto 830/2012, de 25 de junio, por el que se establece la normativa reguladora de la capacitación para realizar tratamientos con biocidas), where it is set that in its proceedings, the technical responsible for the biocidal service will consider the strategies of Integrated Pest Control and follow the principles of Good Practice in Disinfection, insect and rodent control plans described in the UNE 171210

<u>Question 2.</u> Are you aware of existing definitions of IPM for biocides/disinfectants (in other countries and organisations)?

Country	Yes	No	Comments
AUSTRIA	√		Result of an internet search: In different US States IPM seems to be used for pest control, namely in schools: http://schoolipm.wsu.edu/what-is-ipm/ Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management. IPM works by reducing sources of food, water, and shelter for pests and only using least-toxic pesticides when necessary. An effective IPM Program requires identifying and monitoring pest populations, and then selecting the most effective control methods with the least possible hazard to people, pets, and the environment.
CANADA		√	
FINLAND		√	
GERMANY		√	No, not specific for biocides/disinfectants, only from the PPP area
NETHERLANDS		√	
SPAIN		√	

Part B. Principles and criteria used for IPM and disinfectants

Question 3. Could the 8 IPM principles (as described in Annex III of EU Directive 2009/128/EC) applied in agriculture be extrapolated and made relevant for biocides/disinfectants? *(please complete columns 3a., 3b. and 3c.)*

3a. Is this principle applicable to biocides/disinfectants? ***Yes/Possibly/No***
3b. Is your country/organisation considering this principle important? Please rate: ***High (H) / Medium (M) / Low (L)***
3c. Please comment (e.g. amend principle to better fit biocide uses and add specific criteria relevant for disinfectants)
3d. Describe some preventive measures *(more information is given in Questions 4 to 10)*

Principle	Summary of the principle (already adapted to some extent to biocides)
Principle 1 (Prevention)	Prevention and/or suppression of harmful micro-organisms via, e.g., hygiene measures, enhancement of beneficial organisms, improvement of equipment performance.

Country	3a.	3b.	3c.	3d.
AUSTRIA	Yes, presumably with restrictions	H	- the requirements of Annex III for agricultural pesticides cannot be applied directly to biocidal products - a separate catalogue should be elaborated for disinfectants (PT1-PT5) - adequate measures should be subsumed under "hygiene measures", the term "enhancement of beneficial organisms" should be clarified - so far, no microbial biocidal active substance has been approved for disinfection (PT1-5) , acting, e.g., by competing the unwanted microbial flora	- adequate plans and construction material for (public) buildings - aeration/moisture avoidance - cleaning - separation of waste - repeated training of professional operators
CANADA	Possibly	L	In the context of swimming pools, especially in public settings, hygiene measures are already in place in terms of requesting that bathers shower before entering the pool to reduce the bather load in the water	

Country	3a.	3b.	3c.	3d.
FINLAND	Yes	H		
GERMANY	Yes	M – H	Valid for biocides in the current wording	Regular disinfection in hospitals. E. g. in German hospitals hygiene plans to prevent spreading of harmful organisms are established. Adhesion to hygiene is monitored by specifically trained personal.
NETHERLANDS	Possibly	M		The use of condoms on flexible endoscopes without internal channel to prevent contamination of the outer surfaces
SPAIN	Yes	H	UNE 171210 establishes that plagues control involve three stages: • Diagnosis of the situation • Performance program • Evaluation (Plagues includes any harmful species, even microorganisms)	UNE 171210 describes measures Measures to be taken after the diagnosis of the situation and before taking direct control measures: • Measures on structural and constructive elements • Optimization of measures in hygienic- sanitary and environmental conditions • Measures on the development of healthy habits and behaviours

Principle	Summary of the principle (already adapted to some extent to biocides)
Principle 2 (Monitoring)	Monitoring harmful micro-organisms by adequate methods and tools such as e.g., observations, warning systems, forecasting, and early diagnosis systems.

Country	3a.	3b.	3c.	3d.
AUSTRIA	Yes	H	The text for "Principle 2" needs amendments for its application to biocidal products: The request of "early diagnosis systems" is valid.	- in health care /public institutions: regular monitoring and sampling on the basis of a well-defined and, when needed, updated sampling plan. Reliable, specific laboratory tests for early diagnosis. Clinical surveillance
CANADA	No	L		
FINLAND	Yes	M		
GERMANY	Yes	M – H	Valid for biocides in the current wording	E.g. swab testing, collection of samples. In German hospitals monitoring for harmful organisms is carried out on a regular basis.
NETHERLANDS	Possibly	M		In flexible endoscope reprocessing, the final rinse water that is used to rinse away the disinfectant must be free from microorganisms. This is periodically tested.
SPAIN	Yes	H	UNE 171210 The diagnosis of the situation is the outcome of 3 steps: • Previous information collection (risk factors, background…) • Inspection • Analysis of the situation (decision making)	UNE 171210: inspection involves examination in and around the place and detection and quantification of the microorganisms (sampling if necessary)

Principle	Summary of the principle (already adapted to some extent to biocides)
Principle 3 (Decision-making)	Based on the results of monitoring and making use of scientifically sound threshold values, decide whether and when to apply control measures.

Country	3a.	3b.	3c.	3d.
AUSTRIA	-has to be elaborated on a case by case basis -hardly acceptable in the case of human pathogens, especially considering the heterogenicity of a population (children, immune suppressed, old persons) -not aware of existing undoubtful criteria to determine when a certain pathogen increases to a risky level		The text to Principle 3 needs adaptions, Applicability of threshold values should be discussed	
CANADA	No	L		
FINLAND	Yes	H		
GERMANY	Yes	M – H	Valid for biocides in the current wording	E.g. depending on monitoring results specific hygiene commissions in hospitals decide on adequate measures.
NETHERLANDS	Possibly	M		

Country	3a.	3b.	3c.	3d.
SPAIN	Yes	H	UNE 171210: Measures to be taken after the diagnosis of the situation: Measures on structural and constructive elements • Optimization of measures in hygienic- sanitary and environmental conditions • Measures on the development of healthy habits and behaviours. • Direct control measures on microorganisms	UNE 171210: Control strategies: From the diagnosis result, different situations can be found: • No harmful organisms and right environmental situation and low risk → only surveillance. • No harmful organisms but wrong environmental situation or potential sources of microorganisms → measures on constructive elements, hygienic measures and, if necessary, direct control measures. • Harmful organisms ascertained → direct control measures

Principle	Summary of the principle (already adapted to some extent to biocides)
Principle 4 (Non-chemical)	Non-chemical products and measures shall be prioritized.

Country	3a.	3b.	3c.	3d.
AUSTRIA	on a case by case basis, if efficacious enough	in the sense of sustainability H	The description of "Principle 4" fits for biocides	
CANADA	No	L		
FINLAND	Possibly	M		
GERMANY	Highly dependent on the use area	Highly dependent on the use area	Non-chemical products and measures shall be prioritized if applicable.	E.g. thermal disinfection procedures are preferred in Germany. Heat sterilization or other non-chemical measures are used for disinfection in hospitals if applicable. However thermal disinfection procedures are not always applicable, e.g. for disinfection of surfaces it is not applicable.
NETHERLANDS	Yes	H		In particular cases chemical disinfection can be replaced by thermal disinfection
SPAIN	Yes	H	UNE 171210: Performance program: Physical, physic-chemical and biological methods must be priorized	

Principle	Summary of the principle (already adapted to some extent to biocides)
Principle 5 (Specific biocides)	The biocides applied shall be as specific as possible for the target micro-organisms and have the least side effects on human health, non-target organisms, and the environment.

Country	3a.	3b.	3c.	3d.
AUSTRIA	Yes	H	text of the existing version of Annex III so far acceptable	Biocidal products (Product types 1-5), have to fulfil international standards, preferably CEN, at authorisation stage; the respective EU efficacy guidance document is nearly to be finalised under the patronage of ECHA
CANADA	No	L		
FINLAND	Yes	H		
GERMANY	Yes	H	Valid for biocides in the current wording	Disinfectant shall be used accordingly to the special needs, e.g. in case of noroviruses virucidal disinfectants shall be used.
NETHERLANDS	Yes	H		
SPAIN	Yes	H	UNE 171210: In case of use of biocides, it must be selected by: • Kind of microorganism • Microbial load and tolerance threshold • Materials and environment on it is applied • Kind of facilities • Cleaning method (previous and post) • Water quality • Mode of action, time to act, safety time • Persistence of residues • Possible resistances (principle 7)	

Principle	Summary of the principle (already adapted to some extent to biocides)
Principle 6 (Necessary levels)	Keep the use of biocides and other interventions at necessary levels.

Country	3a.	3b.	3c.	3d.
AUSTRIA	Yes	H	Proposal for text amendment: the professional user should keep the use of pesticides and other forms of intervention to levels that are necessary in order to not increase the risk for development of resistance in populations of harmful organisms	Reasonable use of disinfectants, at appropriate concentrations in order to avoid the formation of resistance , cross resistance
CANADA	Possibly	M	In the context of swimming pool disinfectants, the use of specific levels of biocides already exist and necessary interventions are already in place in case of contamination.	
FINLAND	Yes	H		
GERMANY	Yes	H	Valid for biocides in the current wording Disinfection shall be done only if necessary and in consideration of the risk assessment; overdosage should be avoided	Germany thinks that disinfectants in private households are not needed under normal conditions
NETHERLANDS	Yes	H	The use of disinfectants shall be well motivated	
SPAIN	Yes	H	Principle not expressly stated in the (Spanish) standard but implicitly in the section: prevention and risk management.	

Principle	Summary of the principle (already adapted to some extent to biocides)
Principle 7 (Anti-resistance)	Available anti-resistance strategies shall be applied to maintain the effectiveness of the products.

Country	3a.	3b.	3c.	3d.
AUSTRIA	Yes	H	text of Annex III should be adapted for biocidal products	- resistance monitoring by regular sampling and laboratory check - No automatic use of biocides if the single cleaning gives the same result, for instance reduction of 10^4cfu/ml -No use at to low dosage -Alternate disinfectants with active substances of differing reaction mechanisms
CANADA	No	L		
FINLAND	Yes	H		
GERMANY	Yes	H	Valid for biocides in the current wording	Correct use conditions shall be met
NETHERLANDS	Yes	H		
SPAIN	Yes	H	UNE 171210: Possible resistance has to be considered when selecting biocides (see principle 5)	

Principle	Summary of the principle (already adapted to some extent to biocides)
Principle 8 (Check success)	Based on the records and monitoring of biocide usage and harmful micro-organisms, check the success of the control measures.

Country	3a.	3b.	3c.	3d.
AUSTRIA	Yes	H	Text of Annex III in principle acceptable for biocide products.	
CANADA	No			
FINLAND	Yes	H		
GERMANY	Yes	M – H	Valid for biocides; please add resistance	Especially in the medical area, e.g. on medical devices and surfaces (hygienic control inspections)
NETHERLANDS	Possibly	M	For healthcare not really applicable, since there are clear rules for what needs to be disinfected and with what disinfectant. Monitoring of the outcome of the disinfection is not used as a control measure, as it is costly and will not influence future disinfection procedures	
SPAIN	Yes	H	UNE 171210: Evaluation Previously planned, the objective is to estimate: • Level of compliance • Effectiveness • Adverse effects, if any In order to assess if it is necessary to modify the performance program.	

In the questions 4 to 10, each principle presented in question 3 is reviewed in more detail, for each type of disinfectants.

<u>Question 4.</u> Principle 1: Prevention

Type of disinfectant (used by professional operators)	**Describe preventive measures to be recommended / implemented before any disinfectant is being used (you may list several measures per type of disinfectant - or none if N/A)**
14. Disinfectants for surfaces in private homes	AUT Cleaning FIN Maintaining overall cleanliness and cleaning with water and soap/detergent, i.e. non-biocidal chemicals. In general, disinfectants are not needed in households. GER Public awareness campaigns; Public educational work; Hygiene measures (cleaning measure using usual household cleaners are sufficient for private homes, unless people with a suppressed immune system are present in the household) NL Clear indication of the necessity of the use of a disinfectant. Normally disinfectants are not needed in private homes
15. Disinfectants for surfaces in public areas	AUT Cleaning At the time being IPM not applicable to health care institutions according to a representative of the Federal Ministry of Health (AT). In the view of the Competent Authority for Biocides the system of "chemical leasing" could contribute to IPM and could be considered as an option on a case by case basis. FIN Maintaining overall cleanliness and cleaning with water and soap/detergent, i.e. non-biocidal chemicals. In general, disinfectants are usually not needed in public areas GER Establishment of a hygiene plan; Generation of a hazard assessment for the disinfection task and the product; Training of the workers; Hygiene measures / regular maintenance NL Clear indication of the necessity of the use of a disinfectant. Normally disinfectants are not needed in private homes
16. Disinfectants for medical equipment, instruments and devices	AUT Disinfection by steam or dry heat, where appropriate microwaves, irradiation GER Establishment of a hygiene plan; Generation of a hazard assessment for the disinfection task and the product; Training of the workers; Hygiene measures (sterile storage) / regular maintenance NL Application falls under the medical devices directive, disinfectants for this purpose are not biocides
17. Disinfectants for laundries	AUT In private homes disinfectants for laundries not necessary, in general – except the care of persons with infectious diseases is done at home FIN Laundry disinfection is relevant in hospitals (professional use) not needed in households (private use). GER Hygiene measures (high temperature, bleaching, other chemicals, dry and clean storage)

Type of disinfectant (used by professional operators)	**Describe preventive measures to be recommended / implemented before any disinfectant is being used (you may list several measures per type of disinfectant - or none if N/A)**
18. Disinfectants for air conditioning systems	AUT Microbial quality of water is controlled according to a norm ÖNORM B 5020 FIN Maintenance and regular cleaning GER Regular maintenance/ hygiene measures NL Is this really disinfecting, or is it cleaning?
19. Disinfectants for chemical toilets	GER Public awareness campaigns, Public educational work, Regular maintenance / hygiene measures NL Validation of the use of disinfectant. E.g. how long may the disinfectant be used? How much human waste may be added until the disinfectant is no longer active?
20. Disinfectants and algaecides for swimming pools, bathing and other waters	AUT - National legislation fixing the water quality by threshold values of chemical and microbial parameters public pools, saunas and swimming ponds + regular controls and water sampling - general requirement: e.g. Take a shower before entering the swimming pool - in private homes – sand filters CAN In the context of swimming pools, especially in public settings, hygiene measures are already in place in terms of requesting that bathers shower before entering the pool to reduce the bather load in the water GER Public awareness campaigns, Public educational work, Hygiene measures (filtration, manual cleaning, other cleaners) / regular maintenance
21. Disinfectants and algaecides for aquariums	GER Public awareness campaigns, Public educational work, Hygiene measures (water change, manual cleaning) / regular maintenance
22. Disinfectants for wastewater and hospital waste	AUT Disinfection by steam or dry heat, where appropriate microwaves for hospital waste GER Hygiene measures / regular maintenance / in case of hospital waste: special waste management systems NL Is the disinfection of waste a rational application?
23. Disinfectants for industrial areas	AUT Industrial areas could presumably not seen globally – measures could be different according to the food/feed, mechanical sectors GER Hygiene measures / regular maintenance NL Too general
24. Disinfectants for soil and other substrates	AUT Heat treatment GER Hygiene measures
25. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	AUT Washing FIN In general, disinfectants incorporated in textiles and tissues and antibacterial substances in articles to be used by consumers are not needed and this may some cases concern also professional use. This could be considered not proper use of biocides, because biocide should be use only when needed. Washing and cleaning of products e.g. clothes enough often is recommended. GER Public awareness campaigns, Public educational work, Hygiene measures

Type of disinfectant (used by professional operators)	**Describe preventive measures to be recommended / implemented before any disinfectant is being used (you may list several measures per type of disinfectant - or none if N/A)**
26. Other products (to be specified)	SPA Disinfectants against Legionella: Specific legislation exists where preventive measures are set to prevent Legionella in facilities (cooling towers, decorative fountains…, any device where water is sprayed). Real Decreto 865/2003, por el que se establecen los criterios higiénico-sanitarios para la prevención y control de la legionelosis. Articles 6 and 7 set preventive measures in design and maintenance of facilities (avoid areas of stagnant water, temperature control, filtration…)

Question 5. Principle 2: Monitoring

Type of disinfectant (used by professional operators)	Describe monitoring/diagnosis tools for harmful micro-organisms (you may list several tools per type of disinfectant - or none if N/A)
14. Disinfectants for surfaces in private homes	FIN Monitoring is not needed in households. GER None NL None
15. Disinfectants for surfaces in public areas	AUT Regular sampling and lab analysis of microorganisms FIN Monitoring may not be needed in public areas when overall cleanliness is maintained. GER None NL None
16. Disinfectants for medical equipment, instruments and devices	AUT Regular sampling and lab analysis of microorganisms FIN Evidently needed. GER Monitoring only as control for the efficacy of the disinfection process – hygienic control inspections NL Sampling and culturing
17. Disinfectants for laundries	FIN Monitoring is not needed in households. GER Monitoring only as control for the efficacy of the disinfection process – hygienic control inspections
18. Disinfectants for air conditioning systems	AUT Regular sampling and lab analysis of microorganisms GER During regular maintenance
19. Disinfectants for chemical toilets	GER None NL ?
20. Disinfectants and algaecides for swimming pools, bathing and other waters	AUT Regular sampling and lab analysis of different parameters and microorganisms CAN N/A GER None NL Visual observation
21. Disinfectants and algaecides for aquariums	GER None NL Visual observation
22. Disinfectants for wastewater and hospital waste	AUT Regular sampling and lab analysis of different parameters and microorganisms GER None
23. Disinfectants for industrial areas	AUT Regular sampling and lab analysis of different parameters and microorganisms GER None
24. Disinfectants for soil and other substrates	AUT Regular sampling and lab analysis of different parameters and microorganisms GER None

Type of disinfectant (used by professional operators)	**Describe monitoring/diagnosis tools for harmful micro-organisms (you may list several tools per type of disinfectant - or none if N/A)**
25. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	GER None
26. Other products (to be specified)	SPA Disinfectants against Legionella: The royal decree set the analytical method to monitor the presence of Legionella

Question 6. Principle 3: Decision-Making

<table>
<tr><th>Type of disinfectant
(used by professional operators)</th><th>Describe decision-making criteria and scientific threshold values that would (or would not) trigger the use of disinfectants (you may list several criteria per type of disinfectants - or none if N/A)</th></tr>
<tr><td>14. Disinfectants for surfaces in private homes</td><td>AUT Persons with infectious diseases at home</td></tr>
<tr><td>15. Disinfectants for surfaces in public areas</td><td>AUT Schools: occurrence of an infectious disease</td></tr>
<tr><td>16. Disinfectants for medical equipment, instruments and devices</td><td>NL National regulation</td></tr>
<tr><td>17. Disinfectants for laundries</td><td></td></tr>
<tr><td>18. Disinfectants for air conditioning systems</td><td>NL Smell</td></tr>
<tr><td>19. Disinfectants for chemical toilets</td><td>NL Smell</td></tr>
<tr><td>20. Disinfectants and algaecides for swimming pools, bathing and other waters</td><td>AUT threshold values for the water quality already defined legally (Bäderhygienegesetz, BäderhygieneVerordnung, 2013) – threshold values, e.g., for Enterocci, E.coli
<table>
<tr><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr>
<tr><td>Parameter</td><td>Ausgezeichnete Qualität</td><td>Gute Qualität</td><td>Ausreichende Qualität</td><td>Referenzanalyse-methoden</td></tr>
<tr><td>Intestinale Enterokokken (KBE/100 ml)</td><td>200 *</td><td>400 *</td><td>330**</td><td>ISO 7899-1 oder
ISO 7899-2</td></tr>
<tr><td>Escherichia coli
(KBE/100 ml)</td><td>500 *</td><td>1000 *</td><td>900**</td><td>ISO 9308-3 oder
ISO 9308-1</td></tr>
</table>
CAN N/A
NL Water color</td></tr>
</table>

Type of disinfectant (used by professional operators)	**Describe decision-making criteria and scientific threshold values that would (or would not) trigger the use of disinfectants (you may list several criteria per type of disinfectants - or none if N/A)**
21. Disinfectants and algaecides for aquariums	NL Water color, clear glass
22. Disinfectants for wastewater and hospital waste	AUT Type of waste, microorganism; way of separate collection of medical waste
23. Disinfectants for industrial areas	
24. Disinfectants for soil and other substrates	
25. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
26. Other products (to be specified)	SPA Disinfectants against Legionella: The royal decree set frequency of Legionella analysis and measures to be taken depending of the result

Note: in response to Question 6, Germany indicated “Please specify the question, because we do not exactly understand what you mean”

Question 7. Principle 4: Non-chemical

Type of disinfectant (used by professional operators)	**Describe non-chemical products (e.g. alternatives, substitution), measures and processes to be used instead of, or in complement of, disinfectants (you may list several measures per type of disinfectant - or none if N/A)**
1. Disinfectants for surfaces in private homes	AUT cleaning FIN For household use there are several non-biocidal products available. However, they are usually other chemical products. Alternative for chemical products could be e.g. steam cleaner. GER Public awareness campaigns, Public educational work, Hygiene measures (cleaning measure using usual household cleaners are sufficient for private homes, unless people with a suppressed immune system are present in the household) NL Cleaning
2. Disinfectants for surfaces in public areas	AUT Cleaning IPM not applicable to health care institutions according to a representative of the Federal Ministry of Health (AT) GER Hygiene measures NL Cleaning
3. Disinfectants for medical equipment, instruments and devices	AUT Disinfection by steam or dry heat, where appropriate; irradiation GER - Heat sterilization, if possible (thermal stable instruments) - Steam disinfection, if possible (thermal stable instruments) - Hygiene measures (autoclaving) NL Thermal disinfection
4. Disinfectants for laundries	AUT In private homes disinfectants for laundries not necessary, in general – except the care of persons with infectious diseases is done at home FIN For household use normal detergents and high washing temperature is considered sufficient. GER Hygiene measures (high temperature, bleaching, other chemicals) NL Hot washing >90°C
5. Disinfectants for air conditioning systems	GER Regular maintenance / hygiene measures
6. Disinfectants for chemical toilets	GER Public awareness campaigns, Public educational work, Regular maintenance / hygiene measures /

Type of disinfectant (used by professional operators)	**Describe non-chemical products (e.g. alternatives, substitution), measures and processes to be used instead of, or in complement of, disinfectants (you may list several measures per type of disinfectant - or none if N/A)**
7. Disinfectants and algaecides for swimming pools, bathing and other waters	AUT - National legislation fixing the water quality by threshold values for chemical and microbial parameters public pools, saunas and swimming ponds + regular controls and water sampling - general requirement: Shower before entering the swimming pool - in private homes – sand filters CAN N/A GER Public awareness campaigns, public educational work, hygiene measures (filtration, manual cleaning, other cleaners) / regular maintenance NL Filtering
8. Disinfectants and algaecides for aquariums	GER Public awareness campaigns, Public educational work, Hygiene measures (water change, manual cleaning) / regular maintenance NL Filtering
9. Disinfectants for wastewater and hospital waste	AUT Disinfection by steam or dry heat, where appropriate microwaves for hospital waste GER Hygiene measures / regular maintenance In case of hospital waste: special waste management systems
10. Disinfectants for industrial areas	GER Hygiene measures / regular maintenance
11. Disinfectants for soil and other substrates	AUT Heat treatment GER Hygiene measures NL Heating
12. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	AU Washing GER Public awareness campaigns, Public educational work, Hygiene measures, For textiles: normal washing procedures
13. Other products (to be specified)	SPA Disinfectants against Legionella: The royal decree only mention in a general way, that physical method can be used, if it is demonstrate that it is effective enough.

Question 8. Principle 5: Specific biocides

Type of disinfectant (used by professional operators)	**Describe how biocides are specific to harmful micro-organisms**
General	GER In general: depends on the mode of action of the used active substance / product. Specific test methods for different efficacy claims shall be used: bactericidal, levurocidal, fungicidal, virucidal, sporicidal, mycobactericidal. The efficacy against the specific groups of organisms shall be claimed in the product information.
14. Disinfectants for surfaces in private homes	AUT In general no need at all
15. Disinfectants for surfaces in public areas	AUT Requirements given by EN, EU draft guidance on efficacy of disinfectants, product type 2, 3 animals and 4 (food and feed), drinking water
16. Disinfectants for medical equipment, instruments and devices	NL Depends very much on the active ingredients in the product
17. Disinfectants for laundries	
18. Disinfectants for air conditioning systems	
19. Disinfectants for chemical toilets	
20. Disinfectants and algaecides for swimming pools, bathing and other waters	AUT Requirements given by EN, EU draft guidance on efficacy of disinfectants, product type 2 CAN N/A
21. Disinfectants and algaecides for aquariums	
22. Disinfectants for wastewater and hospital waste	AUT Covered by EU draft guidance on efficacy of disinfectants
23. Disinfectants for industrial areas	
24. Disinfectants for soil and other substrates	

Type of disinfectant (used by professional operators)	**Describe how biocides are specific to harmful micro-organisms**
25. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
26. Other products (to be specified)	

Question 9. Principle 6: Necessary levels

Type of disinfectant (used by professional operators)	**Describe how biocides are (or should be) used at necessary levels (e.g. dosages, frequency) on harmful micro-organisms**
General	AUT The use of biocides at an efficacious level is decided during the authorisation procedure of the individual products according to the EU guidance document for disinfectants GER In general: Disinfectants shall be used accordingly to the product information on efficacy and dosages respectively (dosage, user category, RMMs etc. and to codes of best practise). Basis of the use conditions have to be test accordingly to European standards or general accepted national test methods. In Germany, lists of disinfectants with proven efficacy (by independent experts) are published by the "Verbund für Angewandte Hygiene" (VAH-List) and the Robert Koch-Institute (RKI) especially for the medical area. NL In principle, this should be regulated via the authorisation process, in which the dosage and instructions for use on the label are fixed. Products should always be used according to the label instructions to ensure proper use, to avoid overdosing and under dosing (possibility of resistance development).
1. Disinfectants for surfaces in private homes	
2. Disinfectants for surfaces in public areas	
3. Disinfectants for medical equipment, instruments and devices	NL See manual from the disinfectant manufacturer
4. Disinfectants for laundries	
5. Disinfectants for air conditioning systems	
6. Disinfectants for chemical toilets	
7. Disinfectants and algaecides for swimming pools, bathing and other waters	CAN In the context of swimming pool disinfectants, the use of specific/prescriptive levels of biocides already exist and necessary interventions are already in place in case of contamination. NL In line monitoring of the baseline concentration of the disinfectant
8. Disinfectants and algaecides for aquariums	
9. Disinfectants for wastewater and hospital waste	
10. Disinfectants for industrial areas	

Type of disinfectant (used by professional operators)	**Describe how biocides are (or should be) used at necessary levels (e.g. dosages, frequency) on harmful micro-organisms**
11. Disinfectants for soil and other substrates	
12. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
13. Other products (to be specified)	

Question 10. Principle 7: Anti-resistance

Type of disinfectant (used by professional operators)	**Describe possible anti-resistance strategies as far as disinfectants are concerned**	
General	GER	In general: Disinfectants shall be used in the proven conditions (which confirm the efficacy in general accepted tests), e.g. correct concentration, prevention of over- and underdosing, not mixed with other disinfectants or cleaners, and only when absolutely necessary . Where ever possible, results of practical test are demanded. In Germany for the medical area, there are recommendations by authorized commissions, scientific societies on performance of disinfection measures, e.g. recommendations from the "Commission for Hospital Hygiene and Infection Prevention" for preparation of medical products and for surface disinfection in the medical area. These recommendations provide general measures for the proper performing of disinfection: http://www.rki.de/DE/Content/Infekt/Krankenhaushygiene/Kommission/Downloads/Flaeche_Rili.pdf http://www.rki.de/DE/Content/Infekt/Krankenhaushygiene/Kommission/Downloads/Medprod_Rili_2012.pdf The VAH has published three communications for handling of wipes dispenser system which deal with the proper handling avoiding the contamination of such systems. Among other things these recommendations indicate that biofilms should be avoided (regarding point 2. and 3.). At the Federal Institute for Risk Assessment (BfR) there is also a hygiene commission located, prior for the food sector. It deals with the hygiene in daycare centers, etc.
	NL	In general; use the product at the prescribed concentration, time, temperature
14. Disinfectants for surfaces in private homes	AUT	Avoid the use of disinfectants
	GER	Disinfectants in private households are not needed under normal conditions
15. Disinfectants for surfaces in public areas	AUT	Alternate disinfectants with molecules differing in mode of action
16. Disinfectants for medical equipment, instruments and devices	AUT	Alternate disinfectants with molecules differing in mode of action, use as much as possible of physical disinfection processes (autoclaving,..)
17. Disinfectants for laundries	AUT	Alternate disinfectants with molecules differing in mode of action
18. Disinfectants for air conditioning systems	AUT	Alternate disinfectants with molecules differing in mode of action
19. Disinfectants for chemical toilets	AUT	Alternate disinfectants with molecules differing in mode of action

Type of disinfectant (used by professional operators)	**Describe possible anti-resistance strategies as far as disinfectants are concerned**
20. Disinfectants and algaecides for swimming pools, bathing and other waters	AUT Alternate disinfectants with molecules differing in mode of action CAN N/A
21. Disinfectants and algaecides for aquariums	AUT Possibly biological control measures, Alternate disinfectants with molecules differing in mode of action
22. Disinfectants for wastewater and hospital waste	AUT Alternate disinfectants with molecules differing in mode of action, use as much as possible of physical disinfection processes (autoclaving,..)
23. Disinfectants for industrial areas	AUT Alternate disinfectants with active substances differing in mode of action
24. Disinfectants for soil and other substrates	AUT Steam disinfection
25. Products used to be incorporated in textiles, tissues, masks, paints and other articles or materials with the purpose of producing treated articles with disinfecting properties.	
26. Other products (to be specified)	

Part C. IPM actions already taken in Member countries and organisations

<u>Question 11.</u> Is or has your country/organisation been involved in any IPM activities for biocides/disinfectants at the national/regional/international level?

Country	Yes	No	Comments
AUSTRIA		√	Not presently
CANADA		√	
FINLAND	√		At the national level we have just started to consider sustainable use of biocides. This work shall take first into account the biocidal product types where we have had a national authorisation system already, e.g. wood preservatives, antifouling products, rodenticides, insecticides. They are recommended to be used only when needed. For disinfectants there has not been any national authorisation system available in Finland and therefore our knowledge about them is scarce. Nevertheless, we consider this issue important.
GERMANY		√	No, but there are efforts to develop mandatory codes of best practise for a sustainable use of biocides/disinfectants following the PPP area. Furthermore the Federal Environment Agency runs a website (www.biozid.info/) to provide information to the public, where and when the use of biocides/disinfectants is indicated and which measures pose an alternative for the use of these substances (unfortunately in German language only). Due to a possible overlap of general methodological principles, we would like to refer to the national code of best practice for the use of rodenticides that was developed for Germany (unfortunately in German language only): • http://www.baua.de/de/Chemikaliengesetz-Biozidverfahren/Biozide/Produkt/Hintergrund.html Please note that hygiene management may differ depending of the respective federal state law in Germany.
NETHERLANDS		√	

Country	Yes	No	Comments
SPAIN	√		At national level, in the development of standards: UNE 171210, and others in preparation for best practices of disinfection for installations which can spread Legionella.

Question 12. Are you aware of any other IPM activities for biocides/disinfectants (in other countries, in other organisations)?

Country	Yes	No	Comments
AUSTRIA			
CANADA		√	
FINLAND		√	
GERMANY		√	
NETHERLANDS		√	
SPAIN		√	

<u>Question 13.</u> Could you describe the 3 most successful IPM actions and projects *in your country/organisation*, as they relate to disinfectants?

GER: We would suggest involving the German industry to get more information.

Only the Netherlands provided a response

Title of the project	NL: (translated) Working group on prevention of infection (WIP)
Type of disinfectant involved	Not aimed at specific (a) disinfectant(s), but rather aiming to prevent infection in a very broad variety of activities associated with healthcare institutions, such as public health care, hospitals, home care, elderly care, children, also touching broader aspects e.g. waste, hairdressing, building & construction. Instructions for correct use of certain disinfectants may be part of guidelines.
Year project undertaken	Approx. 1985 – 2015
Briefly describe the project and its main elements	The working group Issue guidelines (in Dutch only) with the aim to prevent infections in Dutch healthcare setting by providing practical instruction. The guidelines are professional standards and can be used by Healthcare institutes. Various experts groups (both scientific and field professionals) are involved in writing and a regular scheme of review and updates is maintained. WIP publishes information and guidelines via RIVM website http://www.rivm.nl/Onderwerpen/W/Werkgroep_Infectie_Preventie_WIP
Who was involved in the project?	Dutch Society for Medical Microbiology (NVVM), the Dutch Society for Infectuous Diseases (VIZ) and the Society for Hygiene and Infection prevention in Healthcare (VHIG). Note - all names of societies are translated from Dutch
Why this project was successful?	The centralised aspect (one national focal point), high quality of the guidelines, and the broad scope.

<u>Question 14.</u> Could you describe the 3 most unsuccessful IPM actions and projects *in your country/organisation*, as they relate to disinfectants?

No project was reported by the responding countries

<u>Question 15.</u> Are disinfectant-specific IPM guidelines available and used in your country/organisation? If so, are they available as stand-alone documents or as part of best practice documents?

Country	Yes	No	Comments
AUSTRIA			
CANADA			
FINLAND		√	
GERMANY			The measures that are proposed for the sustainable use of biocides (in the document specified below) are not disinfectant-specific, but some of these general measures are also applicable for a disinfectant-specific IPM. The document is available for download on: http://www.biozid.info/uploads/media/UBA_position_biocides_01.pdf The European Chemicals Agency (ECHA) published a Transitional Guidance on Evaluation of Environmental RMM (risk mitigation measures) for Disinfectants in PT 1 – 5: http://echa.europa.eu/de/guidance-documents/guidance-on-biocides-legislation/transitional-guidance;jsessionid=FCA22C4ED25DED5AF8DC2775DCF362F3.live2 The German industrial association for hygiene and surface protection (IHO) has also published guidance documents on the targeted and efficient use of disinfectants (unfortunately in German language only): https://iho.de/themen/schriftenreihe-desinfektion-richtig-gemacht In households, disinfection is not recommended (recommendation Federal Environment Agency (UBA), Robert Koch-Institute (RKI), BgVV 2000) http://www.rki.de/DE/Content/Infekt/Krankenhaushygiene/Kommission/Downloads/Flaeche_Rili.pdf http://www.rki.de/DE/Content/Infekt/Krankenhaushygiene/Kommission/Downloads/Medprod_Rili_2012.pdf
NETHERLANDS			Not specifically, but the WIP (prevention of infection) guidelines (cf question 13) can be seen as "IPM", although IPM is not defined as such within this area.
SPAIN	√		UNE 171210

<u>Question 16.</u> In your view and given your country/organisation's experience with biocidal products, what are the main drivers for promoting IPM for disinfectants and the possible approaches you consider supportive to IPM adoption and implementation?

Country	Comments
AUSTRIA	Costs Sustainability
CANADA	
FINLAND	Although we do not have much experience with disinfectants, we could think that e.g. resistance can be one of the drivers.
GERMANY	• Targeted use safes money, human health and environment, image of the firm use, minimizing risks to human health and the environment • Guidelines for correct use • Lists of disinfectants with proven efficacy (accordingly general accepted methods) for different uses
NETHERLANDS	Since disinfectants are potential harmful products and the application is also expensive, the use of disinfectants shall be highly rationalized (type of harmful micro-organism, choice of effective disinfection methods, choice of effective products against this organism, choice of effective concentration and contact time). We are not aware of a common approach to implement IPM in the field of disinfectants in our country, apart from areas where this is already done, but not called IPM (see our healthcare example at Question 13). There may be company- or field- specific initiatives but at present we do not have such an overview. It would be worthwhile, but also time-costly to make an inventory of existing IPM-like initiatives (or the lack of those) in all fields listed in the scope of this survey.
SPAIN	The Administration and the sector associations are the main drivers for promoting IPM

<u>Question 17.</u> In your view and given your country/organisation's experience with biocidal products, what are the main barriers to the adoption and implementation of IPM for disinfectants?

→ What needs to be done to remove these?

Country	Comments
AUSTRIA	Clear criteria Proof of feasibility in differing sectors
CANADA	
FINLAND	More information and guidance is needed in order to implement IPM for disinfectants. Meanwhile, we do not have enough knowledge.
GERMANY	The practice and experience so far, lack of information and training, advertising, instilling of fear of microorganisms by the media → Awareness raising, provide information, training and education
NETHERLANDS	For healthcare, well established guidelines on the use of disinfectants are available (see again our WIP description under Question 13). We think that an implementation of an integral IPM approach, applied to disinfectants in such a broad scope as surveyed here, has not been considered at national level in the Netherlands. Hence we can currently not answer as to where barriers would occur.
SPAIN	The main barrier is the education of the professionals

<u>Question 18.</u> Does your country/organisation have a regulatory need for IPM for biocides/disinfectants?

Country	Yes	No	Comments
AUSTRIA			As soon as Directive 2009/128/EC will be adapted to Biocidal products the Directive will be implemented in Austria by national legislation, as formerly done for plant protection products, especially concerning National Action Plans.
CANADA			
FINLAND			
GERMANY	√		Yes, IPM should be mandatory Development of regulatory guidance instruments concerning certificates of competence for professional users, educational and awareness-raising measures for the public
NETHERLANDS			If the question is intended as that there is a regulatory driver to develop IPM for disinfectants, the answer is No.
SPAIN	√		For public health reasons, disinfection in public places and transport has been compulsory. In order to avoid problems in the environment, public health or resistances, IPM has to be regulated.

D. Monitoring IPM projects and successes

<u>Question 19.</u> Does your country/organisation monitor and measure the adoption and implementation of IPM as far as disinfectants are concerned?

Country	Yes	No	Comments
AUSTRIA		√	Not so far
CANADA			
FINLAND		√	
GERMANY		√	No, not yet
NETHERLANDS			Not in healthcare. The use of disinfectants is already reduced to a minimum. As IPM is not implemented as such for the field of 'Disinfection using biocides', there is also no concerted action for monitoring. Any monitoring will be done by the National Inspection, and this may incidentally cover disinfection, but not with IPM for disinfectants as a driver.
SPAIN	√		Inspections are carried out to check the compliance of the legislation, including Real Decreto 830/2010 and Real Decreto 865/2003

Question 20a. If so, could you describe the types of monitoring in place in your country/organisation to follow IPM adoption and impact?

Country	Comments
AUSTRIA	
CANADA	
FINLAND	
GERMANY	
NETHERLANDS	
SPAIN	Surveillance of compliance by Public Health inspectors

Question 20b. In particular, does your country/organisation use *indicators* to measure progress in adoption and implementation of IPM?

Country	Yes	No	Comments
AUSTRIA		√	Not so far
CANADA			
FINLAND			
GERMANY		√	
NETHERLANDS			
SPAIN			Indicators are used, but usually referred to the compliance of the legislation. Not specifically for IPM