

Chapter 19

Communicating Results in a Total Diet Study

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The focus of a total diet study (TDS) is to estimate the chemical exposure, through the diet, of a population or population sub-group to contaminants and nutrients (both naturally occurring and introduced). While determining the concentrations of these chemicals in individual foods or a particular food group is not the primary objective of a TDS, nevertheless both types of information are generated by a TDS and both are of interest to many stakeholders – how many will depend on what particular foods are sampled and which particular analyses are being undertaken. Ensuring that communication of results is performed within the context of the overall TDS, which includes explaining what such a study is (and in some cases, what it is not) is, therefore, an important consideration when determining how and when such communication is to be undertaken.

Introduction

There are essentially two aspects to the results for a TDS; these being the dietary exposures, which are the main focus of a TDS, and the analytical results of the foods that are sampled. Both of these aspects are of interest and given the nature of a TDS, are received at different stages of the overall project. Communicating the results of a TDS is, therefore, not necessarily a single event. Rather, communication of results may be undertaken at several points and to a range of involved or interested parties.

A TDS does not produce a single result of interest or value to only a limited number of parties. Government, industry, academia, consumer organizations and

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consumers themselves will all be interested in the results of a TDS. Using the results of a TDS to influence various stakeholders is presented in Chap. 47 – Involving and Influencing Key Stakeholders and Interest Groups in a Total Diet Study. The levels of interest from these various parties are linked to the actual planning and design of the TDS. The wider the range of foods sampled and chemicals analyzed, the wider will be the range of parties that will be interested in the results.

This fact reinforces the importance of considering how results are to be communicated in the planning and design of a TDS. Developing a plan that captures the release of results as well as communication on other aspects of the entire study is an integral component in the design of a TDS (See Chap. 5 – Scope, Planning and Practicalities of a Total Diet Study). The key features of such a plan should answer the following questions:

- How should the communication be undertaken, and if more than one communication mechanism is available, which is the best in each circumstance?
- Who needs to be communicated with?
- What needs to be communicated?
- When does such communication need to occur?

The development and implementation of such a communication plan is the topic of discussion in the remainder of this chapter.

How Should the Communication Be Undertaken?

How results are to be communicated and who has the responsibility for undertaking such communication, will be influenced by the objectives or goals of the particular TDS. What is the focus of the study? Is the study to encompass the whole country or only a particular region? Will dietary exposures be estimated for more than one age or ethnic group? Is there a particular health concern that is being targeted (e.g. a nutrient deficiency or an environmental contaminant)? Is the study looking to see if a previously implemented risk management decision has been effective? For example, such decisions may relate to: fortifying salt with iodine to address iodine deficiency; stopping the use of lead solder in canned products to reduce dietary exposure to lead; or addressing a previously identified environmental issue such as a discharge of industrial waste into water that is used to irrigate food crops.

When undertaking a TDS for the first time, the design components and goals of the study can guide identification of those likely to be interested in the results. If a TDS had already been undertaken in the past, then an analysis of how that study was reported and the results communicated, and the response or reaction to that communication, should influence how and when the results of the new study are communicated. If the past communication was well received, then a similar approach can be followed. If not, then it will be important to look at why there was dissatisfaction and to consider how this could be addressed and the communication improved. For example, were all the interested parties or organizations aware that

the TDS was being undertaken and that the information would be or was available? If not, can a contact list of such parties be developed and used to keep them informed. Also, how long did it take for the results to be available? If this was a concern, could the timetable be improved or can some interim results or the food sample analysis results be made available? This approach is discussed later in this chapter.

Communication about a TDS and the publication of the results allows a wide range of people and parties to access the information and data that is produced. This communication and publication can occur in a range of ways. However, advances in electronic technology and increased access to the Internet now mean that the available options are not as limited as in the past. An example of a dedicated webpage containing a wide range of information about a country's TDS is on the New Zealand government's food safety website [1].

Production of a full final report in the form of a printed stand alone paper or submitting of some or all of the results for publication as one or more articles in a scientific journal are options that should be considered. However, release of the results on the Internet can mean that such information and data can be made available faster and at less cost. Electronic publication also does not prevent publication in other forms as time and resources permit.

Preparation and issue of a press or media release when results are published can also help to advise the general public and interested parties that such results are available. If there is interest, giving media interviews can be a way of further explaining what a TDS is, why it was undertaken and what the results mean for consumers and other interested parties. Similarly, presentation of results at conferences or seminars is also an effective way to share the information. These also provide an opportunity to focus on a specific aspect of the TDS that is of interest to the particular audience and allow for questions and discussion.

Who Will Be Interested in the Results of a Total Diet Study?

The government agency or research institute that funds a TDS clearly has an interest in the results and may well have processes and protocols that need to be followed in reporting results. Over and above such official or formal reporting requirements, those undertaking the study should also be mindful of the wider range of people, organizations and institutions that will be interested in the results. The results of a TDS will not only be of interest nationally but also regionally and internationally.

Given that a TDS considers what it is that consumers are exposed to through the food they eat, consumers will be one of the main groups that will have an interest in the results. As well as consumers, others in the country who will be interested can include:

- Growers, producers or sellers of the foods, as well as any industry organizations or associations representing those businesses
- Various industries whose chemicals may have been analyzed for in the foods (e.g. agri-chemicals, food additives, and dietary supplements)

- Academic researchers and scientists engaged in a wide range of areas including, public health, nutrition, food technology, animal husbandry, and horticulture
- Government agencies responsible for control and/or monitoring of the food supply (including food ingredients and packaging) from production or importation through processing, manufacturing and distribution to the sale of foods and food ingredients, and
- Those agencies responsible for the wider public health and those involved in environmental management.

Regional or international interest will also be wide ranging and can include those in other countries that undertake TDSs, trading partners (in that a TDS can contribute to the demonstration of food safety controls within a country), and international agencies, such as, the World Health Organization (WHO) through its GEMS/Food Program, the Codex Alimentarius Commission, and the Food and Agriculture Organization of the United Nations (FAO) through the Joint FAO/WHO Joint Expert Committee on Food Additives and the Joint FAO/WHO Joint Meetings on Pesticide Residues.

What Results to Make Available, and When

Although the primary focus of a TDS is the estimation of chemical exposure through the diet and not what concentrations of contaminants or nutrients are present in individual foods or a particular food group, by its nature a TDS does produce data on both these aspects. It is, therefore, important when considering how to communicate the results for both these aspects to ensure that the context of the entire TDS is provided. Setting out the context should include being clear about what a TDS is and what it is not. A TDS normally provides estimates relating to an average consumer. It is not a commodity-based surveillance or monitoring survey, which analyze foods as they are available for sale or ‘as produced’ and compares the results with regulatory limits. Nor is a TDS a nutrition survey – in that the foods within a national nutrition survey are in the thousands rather than the much smaller number of representative foods that is normal in a TDS (refer also to Chap. 1 – Total Diet Studies—What They Are and Why They Are Important).

A TDS provides a snapshot in time of the dietary exposure of a population or population sub-group to contaminants and nutrients (both naturally occurring and introduced) and should not be extrapolated as doing more than this. This snapshot relates to the time when the foods were sampled. When first undertaking a TDS, this information can provide an assurance to consumers that there are no concerns in respect of their food supply, or can indicate areas that need further investigation. However, when a series of TDSs is undertaken, then the results can also provide information on trends over time. This information can help in preparing advice to government as to where resources need to be focused to address a concern or, when risk management actions have been taken previously, can show what impact such actions have achieved.

A full report on a TDS should include all the relevant information about the entire study or at the least, advise where such information is available. An outline of the content of a full report would include:

- An introduction, including an explanation of what a TDS is, why this particular study has been undertaken (the goals or objectives); if relevant the history of TDSs for the country; and an explanation of any changes between this TDS and any previous studies.
- An explanation of the various methodologies used: what foods were sampled (the food list) and why these particular foods were selected; the locations and dates on which foods were collected or purchased; the sample preparation; the population group or groups for whom dietary exposure estimates have been made and how the diets for the group or groups were determined (for example were simulated diets developed); the particular analyses that were undertaken and why these were selected.
- The results of the dietary exposure assessments will also need to be placed in context – what are the results being assessed against; is a comparison also being made against the results in other countries; if there have been previous TDSs in the country; and what are the trends over time.

When presenting the results from a TDS, it is important to consider how the information is formulated and who the target audience is. The reporting of results should be meaningful, relevant and accurate and be done in a way that is clear and understandable. Consideration should be given to the use of figures and diagrams (such as trend graphs and pie charts) as these can greatly assist in presenting numerical and percentage information. The report of the New Zealand TDS uses such an approach and this can be viewed on the New Zealand government's food safety website [1].

While the food sample analytical results of a TDS can only provide a snapshot of what contaminants and nutrients are in the diet of the population, this data can be useful when added to other data sets. For example, the results for particular chemical/food combinations (e.g. nitrates in preserved meats and mercury in fish and seafood), or for a particular element or chemical (e.g. iodine, lead, and persistent organic pollutants) can be added to food chemical concentration databases, including the WHO GEMS/Food Programme database for dietary exposure (See Chap. 46 – OPAL – A Program to Manage Data on Chemicals in Food and the Diet), or to a study that may have looked at the presence of that chemical in the wider environment. If moisture analysis is also undertaken, then data relating to nutrients can usefully be added to a food composition database.

One of the concerns that sometimes has been expressed about access to the results of a TDS is the length of time between the collection of food samples and the release of the analytical data and the dietary exposures. Where more than one round of sampling is undertaken, consideration can also be given to releasing the sample analysis results after each sampling round, once they have been checked for accuracy and the appropriate laboratory quality controls completed.

In making available the results of the food sample analyses, it is important to ensure that such information is placed in the proper context. A TDS, by its nature,

provide results for a moment in time depending on the period of time over which the food samples were collected, and the number of occasions the same food was sampled. For example, the collection or purchase of a sample of each food twice in a 1-year period (each 6 months apart) can provide information that captures seasonal variation.

The limited number of samples collected and the random nature of the brands collected (i.e. while the sample collectors may be instructed to purchase particular commonly available brands of a product, what is actually available in the marketplace at the time of sampling may dictate that only some brands are purchased), are also a reason for not specifically releasing brand or product identity information when the analysis results show that the levels of a particular chemical or chemical residue are within the expected or allowable range. The results of a TDS should not be used to either endorse or denigrate a particular supplier or brand of a product just because it happened to be the one that was purchased on a particular day. However, there may be instances when a result from a TDS indicates a potential risk to consumers that requires timely investigation and assessment by the relevant government agency and this may result in the identification of a product.

Communicating Unusual or Unexpected Results Identified During Sample Analysis in a Total Diet Study

A TDS is not usually considered useful as a compliance monitoring or surveillance tool. The primary purpose is to estimate population average dietary exposures to selected chemicals, contaminants and nutrient elements, and to identify trends over time. As a result, sampling in a TDS is traditionally not as extensive or statistically robust as most international recognized compliance monitoring or surveillance programs. Furthermore, the food samples in a TDS are analyzed after being prepared as for normal consumption; so bananas are peeled, meats cooked, etc. Generally, this extra sample preparation will lower the measured levels of many analytes compared to those found in the raw agricultural commodity state that is usually measured in a monitoring or surveillance program. The foods sampled are also composited within or across regions, brands and/or seasons depending on the particular analysis being undertaken and the resources available.

One of the decisions that needs to be made during the planning of a TDS is, therefore, what to do if a single result is outside the norm or what would reasonably be expected, or is at or above a regulatory limit that may apply. In some instances such a result may indicate a possible public health risk. However, this will need to be confirmed by extra means. Provision needs to be made for ensuring that results of this nature are able to be passed to the relevant government agencies in a timely manner so that any risk can be appropriately assessed, which may involve collection and analysis of additional samples outside the TDS itself and a decision made on what, if any, is the appropriate action. It is, therefore, important to ensure that provision for such notification is included in the design and planning of a TDS.

The government agency responsible for the control of the food supply will also need to have considered how it will deal with any such results from the TDS, including how and when it would expect to receive notification and whom in the agency will take responsibility for assessing the information, seeking additional information as necessary and deciding on the appropriate response, if any.

During the 2003–2004 New Zealand TDS, an analytical result identified an unacceptably high concentration of lead in an infant food. The product was recalled and it was identified that the source of the contamination was corn flour used in the product. Subsequent investigation identified that three batches of corn flour had lead contamination; all had been milled from one shipment of imported corn, which had been contaminated with lead during shipping. Packaged corn flour and products that used the corn flour as an ingredient were assessed and products with unacceptable levels of lead were recalled. Information communicating this event and how it was dealt with by the responsible government agency¹, including the risk assessment (relating to the various products and the dietary exposure risk for children and adults), the products recalled, and the various media announcements were also published on the agency's website as well as being communicated directly to relevant affected or interested parties in New Zealand and internationally (See also Chap. 35 – New Zealand's Experience in Total Diet Studies).

Conclusion

While a TDS is a key tool in exposure assessment and risk assessment, which can then help guide the selection of risk management options, the effective communication of a TDS, its results and their significance is just as pivotal in the risk analysis context.

To be effective, the communication of TDS results needs to consider how the communication should be undertaken, and if more than one mechanism is available, which is the best option in differing circumstances. It should also consider who needs to be communicated with, what needs to be communicated and when such communication should occur.

Reference

1. <http://www.foodsafety.govt.nz/science-risk/programmes/total-diet-survey.htm>

¹At that time the responsible agency was the New Zealand Food Safety Authority (NZFSA). The NZFSA was established in 2002. From 1 July 2010 NZFSA was amalgamated with the New Zealand Ministry of Agriculture and Forestry (MAF), and on 1 July 2011, the Ministry of Fisheries was also merged into MAF. On the 30 April 2012, the new ministry became the Ministry for Primary Industries (MPI).