DATA MANAGEMENT FOR FOODBORNE DISEASES IN EUROPE

WORLD HEALTH ORGANIZATION
Regional Office for Europe
COPENHAGEN

TARGET 22

Food safety

By 1990, all Member States should have significantly reduced health risks from food contamination and implemented measures to protect consumers from harmful chemicals.

Index:

FOOD POISONING
EPIDEMIOLOGY
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EUR

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Report on a WHO Consultation

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Note

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Introduction

Any decision on priorities, resources and management in the control and prevention of foodborne infection depends essentially on accurate and adequate epidemiological data. Several European countries have found that computerized epidemiological investigation programs improve analysis quality, data management, reporting systems and comparability.

As the European Charter on Environment and Health says, a strong information system is strategic for monitoring effectiveness, analysing trends, setting priorities and making decisions. Epidemiological surveillance produces information for intersectoral environmental health management.

In October 1989 consultants on national and international systems for reporting, early warning and surveillance of foodborne infections and intoxications recommended that the Regional Office should set up an international data-management programme. They said that national services should use the same information systems and communication protocols. However, European countries are not all at the same stage. To promote uniformity and multinational comparability, they need a standardized data output format and protocol.

WHO arranged this Consultation of six temporary advisers to find out how European countries are using computer programs in epidemiological investigations, data management and reporting, and to obtain recommendations on a standardized data output format and communication protocol for countries participating in the European surveillance programme.

Survey results

Each focal point in the surveillance programme received a questionnaire that contained 11 questions on how the computers were used to collect data and evaluate foodborne diseases. Twenty-eight countries sent 24 replies.

Fifteen of them use computers at their central office and only a few elsewhere (Table 1). Table 2 lists the commercial database programs and statistical packages used. Only one country uses the same program throughout. Although used widely in the United States EPI INFO is uncommon in Europe.

Table 3 shows that MS-DOS is the most popular PC-operating system, but UNIX and VME are also used. Only two countries have computerized the exchange of data between levels (Table 4); the others use paper forms. Twelve use standard coding systems (Table 5) most specific for the country. Three use ICD and one sometimes uses SNOMED. In addition to the data required by the program, most countries record serovars of enteric pathogens (Table 6).

Table 7 shows that 12 of the 15 countries with central computers would prefer to transmit summarized data on disks. The management in Berlin and the remaining three countries confirmed that they would use paper. According to Table 8, 13 countries would accept EPI INFO for national use; two suggest dbase. Table 9 shows that 12 are willing to feed an international database (mailbox) at the management in Berlin. One is unwilling and the rest are not sure. Only two countries agree to an updating frequency of three months. Nine suggest six months and six prefer a year (Table 10).

Table 1. Use of computers[a]

Country	Level 1	Level 2	Level 3
Albania	n	n	n
Belgium	?	y	y
Cyprus	n	n	n
Czechoslovakia	y	y	y
Denmark	n	n	n
England & Wales	y	y	y
Finland	n	n	n
France[b]	y	n	y
Federal Republic of Germany	n	n	n
German Democratic Republic	n	n	n
Iceland	-	-	y
Italy	n	n	n
Luxembourg	-	-	y
Netherlands	In part	In part	y
Norway	n	n	y
Malta	y	-	y
Monaco	-	-	n
Poland	n	In part	y
Romania	n	n	y
Scotland	-	In part	y
Sweden	n	In part	y
Switzerland	n	In part	y
USSR	n	y	y
Yugoslavia	n	n	n
Totals:			
Yes	3	4	14
No	14	10	9
In part	1	5	
Not applicable	5	4	

[a] y = yes; n = no. [b] Outbreaks only.

Table 2. Use of programmes[a]

Country	Level 1	Level 2	Level 3
Albania	n	n	n
Belgium	?	EPI INFO	EPI INFO
Cyprus	n	n	n
Czechoslovakia	M-ISPO	M-ISPO	M-ISPO
Denmark	n	n	n
England & Wales	Various[b]	Various[b]	Various[c]
Finland	n	n	n
France	?	n	?
Federal Republic of Germany	n	n	n
German Democratic Republic	n	n	n
Iceland	-	-	Self-made
Italy	n	n	n
Luxembourg	-	-	Epistol
Netherlands	dbase	EDS/LOTUS 1,2,3/Genstat/ Unix tools	Various
Norway	n	n	SPSS/PC EPI INFO
Malta	Fileman	-	Fileman adapted
Monaco	-	-	n
Poland	n	Various	Self-made
Romania	n	n	Self-made
Scotland	-	Various	ISD-SPSS CDSU-dataease
Sweden	n	Various[d]	Self-made
Switzerland	n	?	dbase, statistic packages
USSR	n	?	Oracle RDBMS v.5
Yugoslavia	n	n	n

[a] y = yes; n = no.
[b] E.g. Dataease, Supercalc, SPSS.
[c] E.g. Dataease, Oracle, Model 204, SPSS, Harvard Graphics.
[d] E.g. dbase, Filemaker, Hypercard.

Table 3. Use of operating systems[a]

Country	Level 1	Level 2	Level 3
Albania	n	n	n
Belgium	?	MS-DOS	MS-DOS
Cyprus	n	n	n
Czechoslovakia	MS-DOS	MS-DOS	MS-DOS
Denmark	n	n	n
England & Wales	MS-DOS	MS-DOS	MS-DOS, UNIX
Finland	n	n	n
France	MS-DOS	n	MS-DOS
Federal Republic of Germany	n	n	n
German Democratic Republic	n	n	n
Iceland	-	-	MS-DOS
Italy	n	n	n
Luxembourg	-	-	MS-DOS
Netherlands	Highly variable	Highly variable	UNIX
Norway	n	n	MS-DOS
Malta	MUMPS	MUMPS	MUMPS
Monaco	-	-	n
Poland	n	DOS	DOS
Romania	n	n	?
Scotland	-	MS-DOS	ISD-VME/ MS-DOS
Sweden	n	Macintosh	?
Switzerland	n	?	DOS
USSR	n	?	Micro VMS VAX op. system
Yugoslavia	n	n	n
Total	5	8	13
MS-DOS[b]	4	5(6)[c]	8(10)[c]
Mainframe[b]	2	2	5

[a] y = yes; n = no.
[b] Includes various.
[c] Includes DOS.

Table 4. Computerized exchange of data between levels

Country	Exchange
Albania	None
Belgium	None
Cyprus	-
Czechoslovakia	Disk
Denmark	None
England & Wales	Disk, IPSS, Kermit
Finland	None
France	None
Federal Republic of Germany	None
German Democratic Republic	None
Iceland	-
Italy	-
Luxembourg	-
Netherlands	None
Norway	None
Malta	None
Monaco	-
Poland	None
Romania	None
Scotland	None
Sweden	None
Switzerland	None
USSR	None
Yugoslavia	None

Note: Most countries have standardized form sheets to report data collected.

Table 5. Use of standardized coding systems[a]

Country	Use	Comments
Albania	y	ICD
Belgium	n	
Cyprus	y	ICD-9
Czechoslovakia	y	ICD-9, ISPO-Code (profession, localization, serovars)
Denmark	n	Standard list
England & Wales	y	Organisms. SNOMED, some other systems
Finland	n	
France	?	
Federal Republic of Germany	y	National (standard list)
German Democratic Republic	n	
Iceland	y	National short notation
Italy	-	
Luxembourg	n	
Netherlands	y	National (standard list)
Norway	y	National, can be translated into ICD
Malta	n	
Monaco	n	
Poland	y	National (foods, places, etiological agents)
Romania	y	National (diseases)
Scotland	y	National (standard list)
Sweden	y	
Switzerland	n	
USSR	n	
Yugoslavia	n	

[a] y = yes; n = no.

Table 6. Supply of additional data

Country	Yes/No	Comments
Albania	n	
Belgium	y	Serovars
Cyprus	n	
Czechoslovakia	y	Serovars (common Salmonella)
Denmark	n	
England & Wales	y	Serovars, phage type, age, sex, area, date on onset ...
Finland	n	
France	y	Serovars
Federal Republic of Germany	n	
German Democratic Republic	n	
Iceland	y	Serovars
Italy	-	
Luxembourg	n	
Netherlands	y	Incubation time, symptoms
Norway	y	Serovars, age
Malta	n	Age, employment, notifying doctor, martial status
Monaco	n	
Poland	y	Serovars, age
Romania	y	Serovars (humans, animal, environment)
Scotland	y	Additional to ISD (D) 8 form
Sweden	y	
Switzerland	n	
USSR	y	Serovars, age
Yugoslavia	n	

Table 7. Use of computers and possibility of data transfer to focal point[a]

Country	Level 1	Level 2	Level 3	Facilities[b]
Albania	n	n	n	
Belgium	?	y	y	p,d
Cyprus	n	n	n	
Czechoslovakia	y	y	y	d
Denmark	n	n	n	
England & Wales	y	y	y	p,d,m,OPCS monitor
Finland	n	n	n	
France	y	n	y	d
Federal Republic of Germany	n	n	n	
German Democratic Republic	n	n	n	
Iceland	-	-	y	p,d
Italy	n	n	n	
Luxembourg	-	-	y	d
Netherlands	In part	In part	y	d
Norway	n	n	y	m
Malta	y	-	y	p,d
Monaco	-	-	n	
Poland	n	In part	y	p,d
Romania	n	n	y	p
Scotland	-	In part	y	p,d
Sweden	n	In part	y	p
Switzerland	n	In part	y	p
USSR	n	y	y	p,d
Yugoslavia	n	n	n	

[a] y = yes; n = no.
[b] p = paper (also means month and annual reports); d = disk; t = tape; m = modem.

Table 8. Possible acceptance of EPI INFO

Country	Yes	No	Not sure	No answer	Others recommended
Albania			1		
Belgium				1	
Cyprus				1	
Czechoslovakia	1				
Denmark	1				
England & Wales[a]			1		
Finland				1	
France	1				
Federal Republic of Germany	1				
German Democratic Republic	1				
Iceland	1				
Italy				1	
Luxembourg		1			dbase
Netherlands	1				
Norway	1				
Malta	1				
Monaco		1			
Poland			1		Self-made program
Romania	1				
Scotland	1				
Sweden				1	
Switzerland	1				dbase
USSR			1		
Yugoslavia	1				
Total	13	2	4	5	

[a] Problem of database size and development tools.

Table 9. Regular support of an international database

Country	Yes	No	Not sure	No answer
Albania			1	
Belgium	1			
Cyprus	1			
Czechoslovakia	1			
Denmark		1		
England & Wales	1			
Finland			1	
France	1			
Federal Republic of Germany				1
German Democratic Republic				1
Iceland	1			
Italy				1
Luxembourg			1	
Netherlands	1			
Norway	1			
Malta	1			
Monaco				1
Poland	1			
Romania	1			
Scotland			1	
Sweden				1
Switzerland			1	
USSR				1
Yugoslavia	1			
Total	12	1	5	6

Table 10. Updating frequency of an international database

Country	Months			
	1	3	6	12
Albania[a]			1	
Belgium				1
Cyprus			1	
Czechoslovakia			1	
Denmark			1	
England & Wales[b]				1
Finland				
France				1
Federal Republic of Germany				
German Democratic Republic		1		
Iceland				1
Italy				
Luxembourg				
Netherlands			1	
Norway			1	
Malta			1	
Monaco				
Poland				1
Romania[c]			1	
Scotland			1	
Sweden				
Switzerland				
USSR				1
Yugoslavia		1		
Total	0	2	9	6

[a] Intercountry problems more frequently.
[b] Depends on reasons for collecting data.
[c] Three or six months.

Note: Five countries gave no specific answer.

Conclusions

1. Surveillance of foodborne disease forms part of communicable disease surveillance, but implies certain more detailed requirements.

2. The clear trend is for foodborne disease investigation and surveillance programmes to be computerized, mainly at the national centre. If data are transferred on paper from the investigation site, useful details are often lost. Inaccuracies may occur during transcription. Work is duplicated.

3. Countries use commercial programs of various sorts and different operating systems, which make it more complicated to exchange data. They need guidance on standard data-collection programs and communication must be made easier to meet the needs of the WHO surveillance programme.

4. As MS-DOS is the most popular operating system, common sense dictates adoption of a program that runs off MS-DOS. However, the program should also work with other widely used systems such as UNIX.

5. EPI INFO version 5 is an epidemiological PC program featuring wordprocessing, a database, statistics and simple graphics. Although not common in Europe, it is on the market and WHO supports it. The program is user-friendly, runs off MS-DOS and makes it easy to report data to regional, national and international centres for analysis. It has many uses - questionnaire design, outbreak investigation, routine data collection, and others - which save resources and training time. EPI INFO files can be exchanged with those of other common programs.

6. Some implications of adopting EPI INFO throughout Europe need to be considered. CDC/USA developed it as a 3.0 version and the manual would need to be translated into European languages. To get it fully accepted and to standardize data collection, the international and national centres would have to arrange training programmes.

7. Although national centres could use EPI INFO for analysis, its suitability would depend on the size of the data set. For a too large data set, individual countries would need to make other arrangements, but the output must be compatible. The Berlin centre still requires the same minimum data set which can easily be entered with EPI INFO. The staff will design the computerized report form to ensure standardized input. Countries using other systems could adapt their output formats accordingly. To make data transfer to the centre and compilation easier field types and field lengths will have to be defined.

8. The members of the working group believe that descriptions of terms and coding should be standardized. The draft ICD-10 classification does not give enough detail for the WHO programme. ICD-10 can be used, but only with an extra coding list for microorganisms. Some coding lists used under the program are adequate; the organism list needs to be expanded. Other work done in Europe, such as the CEN AIM project EUCLIDES and coding systems such as SNOMED, may prove useful. Countries using more detailed coding lists must make sure that they can be aggregated to conform with the codes approved for the WHO programme.

9. Within countries transfer of data by disk, modem or network would reduce paperwork and promote accuracy; the group members felt that each country should encourage this according to its needs.

10. For data transfer to the WHO collaborating centre in Berlin, a disk is preferable. However, countries without disks may complete the standard WHO form. The preference for disks also applies to news items (such as descriptions of outbreaks and trend analyses) intended for the newsletter or for an electronic information system. The PHLS Epinet network used in England and Wales is a model system. Data being transferred between one country and another need to be protected by law.

11. Participating countries should agree on a schedule for computerizing their databases and should decide how often they will transfer data to the WHO centre. This will dictate the appropriate intervals for updating the database.

12. The working group members support the attempt to increase computerized information exchange between regional United Nation Development Programme (UNDP) programmes. INTERNET, the UNDP/UNESCO[a] regional network, would be a suitable central project.

Recommendations

1. Countries should promote the use of computers to survey and investigate foodborne disease. This will improve the standard of data, reduce paperwork and make it easier to conduct the international surveillance programme. Where possible they should take account of the need to survey other communicable diseases.

2. Countries should adopt the EPI INFO computer program for epidemiological investigation and surveillance of foodborne infections.

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[a] United Nations Educational, Scientific and Cultural Organization.

3. With the appropriate WHO staff, the Berlin centre should standardize EPI INFO report forms, processing procedures and output formats.

4. Participating countries should adhere to any agreed WHO surveillance programme codes.

5. To add to the ICD-10 codes, a detailed organism code list should be established. It should take into account existing codes, such as SNOMED, and those under development, such as CEN EUCLIDES.

6. WHO programme staff should start the computerized database as soon as possible. Each country should send data to the Berlin centre at least once a year. Those which cannot yet send computerized data should enter them on a WHO form.

7. Participants in the WHO surveillance programme should consider forming a network like Epinet, to exchange data and news items.

8. To increase central and eastern Europe's capacity for computerized information exchange, WHO should work closely with UNDP and INTERNET. WHO staff should find out whether UNDP and INTERNET could invest in hardware and software to complete the proposed information network.

Annex 1

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