



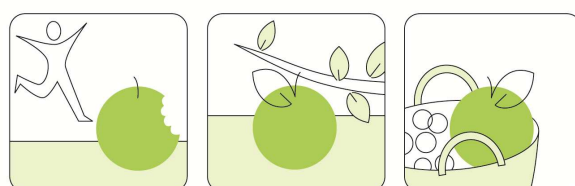
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**Identifying cardiovascular diseases (CVDs) by
using one or more information sources**

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The occurrence of cardiovascular diseases (CVD) in Greece has been studied in the EPIC-Greece cohort, which relies on a general population sample of 28,572 adult men and women, from all over the country. Prevalent at enrollment CVD cases have been excluded from the tabulations presented in this report.

1. The EPIC-Greece study

The enrolment of participants in the Greek component of the European Prospective Investigation into Cancer and Nutrition (EPIC) took place between 1994 and 1999. A total of 28,572 participants, 20 to 86 years old, were recruited from all over Greece. EPIC is conducted in 23 research centers in 10 European countries, with the purpose of investigating the role of biologic, dietary, lifestyle, and environmental factors in the etiology of cancer and other chronic diseases. All procedures were in accordance with the Helsinki Declaration, all participants provided written informed consent, and the study protocol was approved by the ethics committees at the International Agency for Research on Cancer and the University of Athens Medical School.

Follow-up was active and conducted at regular time intervals through telephone contacts with the participants or, in case of death, their next of kin. A structured form was filled in by specially trained health professionals and when an incident CVD event was reported, verification was sought through medical records, discharge diagnoses or death certificates, according to specified guidelines for the collection of end-point data. Classification of cases was performed on the basis of the 10th revision of the International Classification of Diseases (ICD).

2. EPIC-Greece in EUPHORIC

With partial support from EUPHORIC, qualified physicians visited more than 50 hospitals around Greece in order to search medical records and hospital discharge files and they manage to retrieve information on coronary heart disease diagnoses from many, though not all, of them.

The following ICD codes were used per diagnostic category of coronary heart disease (CHD):

Myocardial infarction (MI)

I21 Acute myocardial infarction

I22 Subsequent myocardial infarction

I23 Certain current complications following acute myocardial infarction

Angina

I20 Angina pectoris

Other CHD

I24 Other acute ischaemic heart disease

I25 Chronic ischaemic heart disease

I46 Cardiac arrest

I51.9 Heart disease unspecified

Z95.1 Presence of aortocoronary bypass graft

Z95.5 Presence of coronary angioplasty implant and graft

Number of reported incident cases per diagnostic category are presented in Table 1. When multiple diagnoses per case are recorded, each case is counted only once and myocardial infarction overrides coronary heart disease, which in turn overrides angina.

In Table 2, the results of the evaluation - through medical records, hospital discharge or death certificates – of 247 of the reported 497 cases of MI are presented.

In Table 3, the results of the evaluation of 31 of the reported 120 cases of angina are presented.

In Table 4, the results of the evaluation of 264 of the reported 954 other (than MI or angina) CHD cases are presented.

In Table 5, we indicate deaths from or incident cases of MI, angina and other CHD as confirmed from medical records, hospital discharges or death certificates, even though the conditions had been reported by the EPIC volunteers during the follow-up contacts.

It should be noted that most cases classified under “CHD other than MI or angina” are actually MIs, complications of MIs, or consequences of MIs. They have not been classified under MIs in this report, because MI is not the formal diagnosis in the discharge record or the death certificate (e.g. cardiac arrest is frequently indicated in the death certificate). Moreover, as a rule, the diagnosis of myocardial infarction requires both a diagnostic electrocardiogram and elevation of enzymes, although the relevant test results are frequently missing from the patients medical files, or the files themselves cannot be recovered. Thus strict conformity to the MONICA criteria is possible only for 37 MI cases.

3. Using information of both medical records and hospital discharge abstracts

With respect to sample selection we routinely attempt to identify medical records of all study participants who, during active follow up, have reported CVD (cardio vascular disease) or any type of cancer. When medical records are not found we rely on hospital discharge information. Reasonably complete medical records are identifiable in about 1/3 of instances, whereas inadequate medical records in another 1/3. When medical records are not identified or the required information is missing we search for hospital discharge data, which can be made available in about 50% of the instances.

When a major disease (CVD or cancer) is not reported at follow up, searches for medical records and hospital discharges are done only after the possible death of the studied participants. At the writing of this report validation has been attempted for about 2/3 of the cases of CVD or incident cancer reported until mid 2008. Under these constraints, we could identify no additional selection factors.

As indicated in tables 1-5, we have been able to evaluate 247 of the reported 497 cases of MI (myocardial infarction), 31 of the reported 120 angina cases and 264 of the reported 954 other coronary heart disease (CHD) cases (other than MI or angina).

In Greece hospital diagnosis of CHD and in particular MI follows explicitly or implicitly the MONICA criteria (certainly repeated ECG recordings, multiple measurements of serum cardiac enzymes as well as symptomatology of a coronary event). We generally consider as valid diagnosis of CHD when indicated in either medical records or at the hospital discharge documents. This explains why the numbers indicated as confirmed MI, confirmed angina and confirmed as “other CHD” (in most instances of which the coexistence of underlying or preceding MI can be inferred) shown in tables 2-3-4, are generally larger than these indicated in the table 6. In essence, tables 2-3-4 rely on evaluation based on either medical records or hospital discharge information whereas table 6 requires information of BOTH medical records and hospital discharge documents.

Table 6 includes participants whose records were searched because they have reported either a cardiovascular episode or an incident cancer (which would inflate the cell of “no CHD” from either source). On the other hand Cohen’s Kappa may be misestimated because the diagnosis of “other CHD” frequently reflects underlying or preceding MI.

Table 1. EPIC – Greece: Reported incident coronary heart disease cases as of June 2008

	MI	Angina	Other CHD*	Total CHD
Reported	497	120	954	1571
Not evaluated	250	89	690	1029
Evaluated	247	31	264	542

*In most instances the coexistence of underlying myocardial infarction can be inferred.

Table 2. EPIC – Greece: Evaluation of 247 of the reported 497 cases of myocardial infarction (MI) cases as of June 2008

	Method of evaluation	
	Medical record or hospital discharge	Death certificates
Confirmed as MI	122	8
Confirmed as angina	10	0
Confirmed as other CHD	41	11
Confirmed as CVD other than CHD	2	5
Confirmed as other than CVD	22	26
TOTAL evaluated	197	50

Table 3. EPIC – Greece: Evaluation of 31 of the reported 120 angina cases as of June 2008

	Method of evaluation	
	Medical record or hospital discharge	Death certificates
Confirmed as MI	0	2
Confirmed as angina	7	0
Confirmed as other CHD	3	4
Confirmed as CVD other than CHD	2	1
Confirmed as other than CVD	8	4
TOTAL evaluated	20	11

Table 4. EPIC – Greece: Evaluation of of 264 of the reported 954 other (than MI or angina) CHD* cases as of June 2008

	Method of evaluation	
	Medical record or hospital discharge	Death certificates
Confirmed as MI	12	5
Confirmed as angina	18	0
Confirmed as other CHD	128	14
Confirmed as CVD other than CHD	8	8
Confirmed as other than CVD	40	31
TOTAL evaluated	206	58

*In most instances the coexistence of underlying myocardial infarction can be inferred

Table 5. Incident cases of MI, angina and other CHD as confirmed from medical records, hospital discharges or death certificates, among volunteers who had not reported these conditions during the follow-up contacts

	Method of evaluation		TOTAL
	Medical record or hospital discharge	Death certificates	
Confirmed as MI	4	183	187
Confirmed as angina	2	0	2
Confirmed as other CHD	8	219	227

Table 6. EPIC-Greece: Pattern of concordance of myocardial infarction, angina pectoris and “other forms of coronary heart disease” between medical records and hospital discharge diagnosis.

		Medical records				Total
		MI*	Other CHD**	Angina***	No CHD	
Hospital discharge	MI	11	4	0	1	16
	Other CHD	4	11	1	7	23
	Angina	0	1	1	0	2
	No CHD	3	4	0	364	371
Total		18	20	2	372	

*MI: out of a total 130 with MI in either medical records or hospital discharge (table2)

**Other CHD out of a total of 142 with CHD in either medical records or hospital discharge (table 4)

***Angina: out of a total 7 with angina in either medical records or hospital discharge (table3)