Epidémiologie du cancer bronchique

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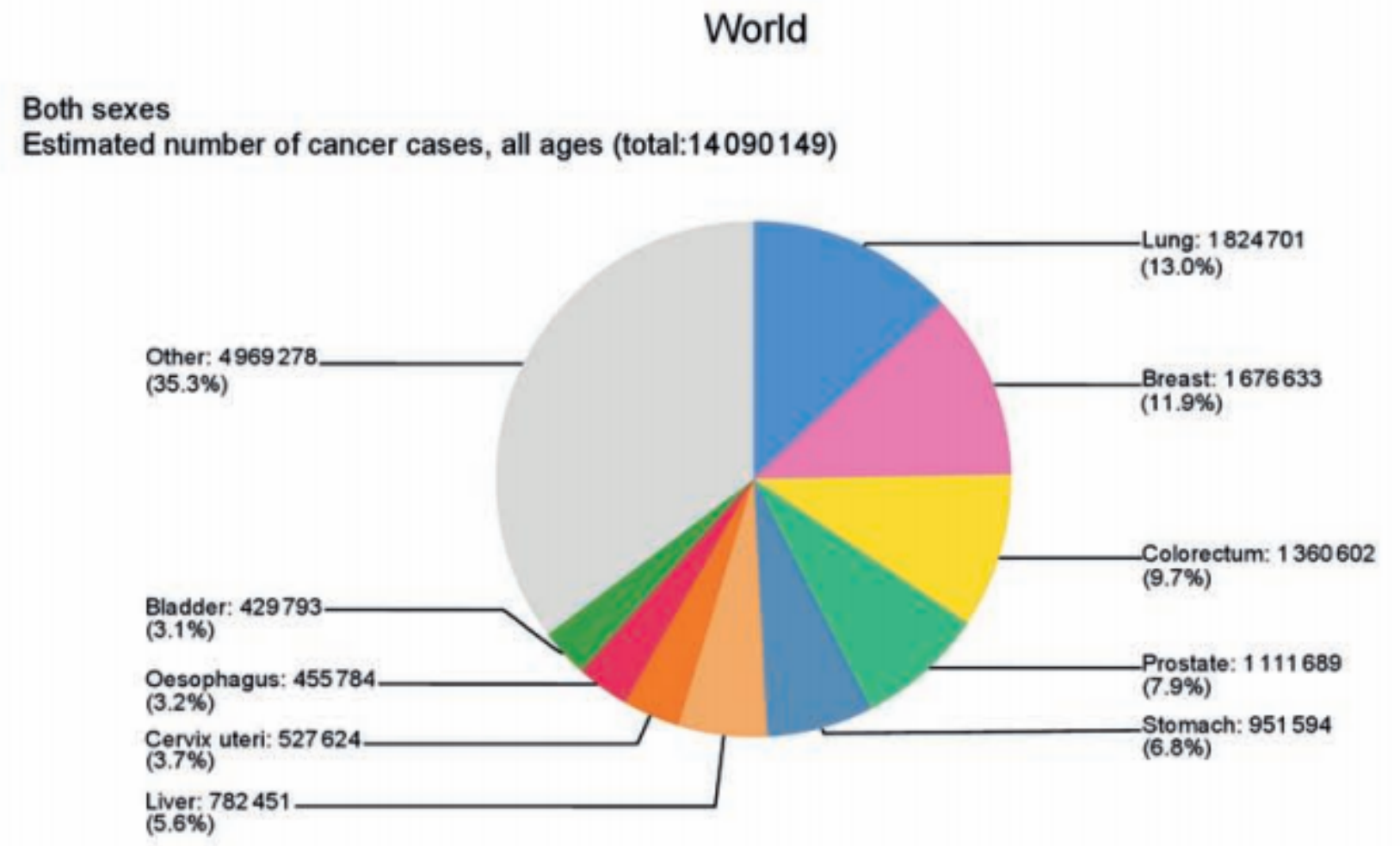
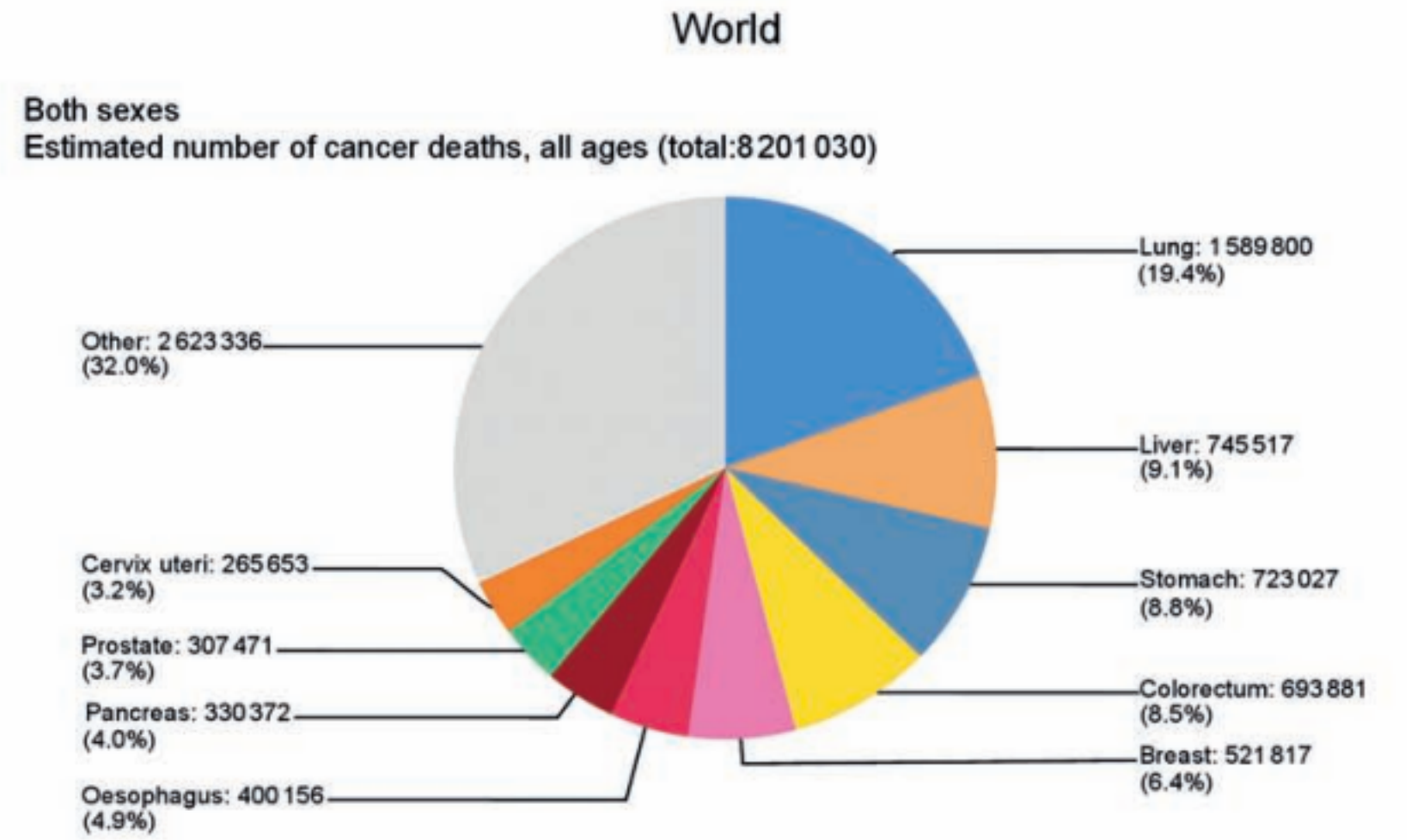
Université Paris Descartes
INSERM UMR-S 1007, Homéostasie cellulaire et cancer

Estimated world cancer incidence proportions by major sites, in both sexes combined, in men, and in women, 2012.



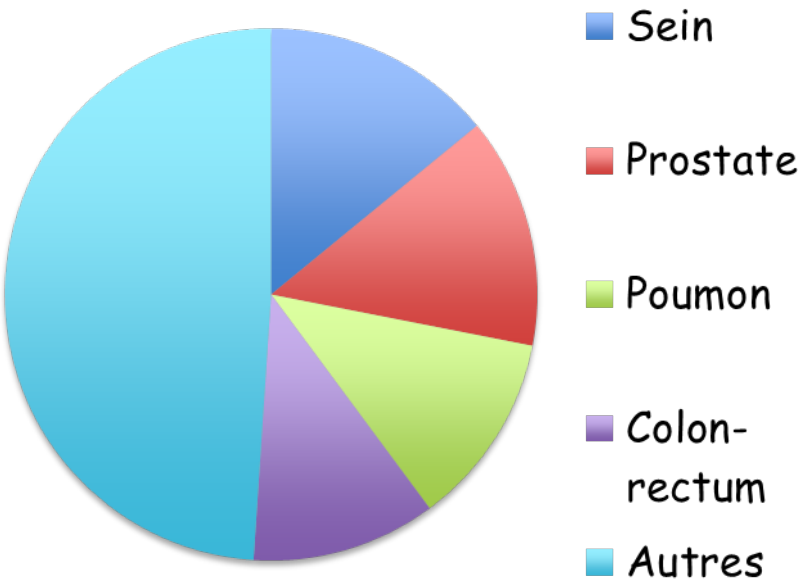
IARC, World Cancer Report 2014

Estimated world cancer mortality proportions by major sites, in both sexes combined, in men, and in women, 2012.



IARC, World Cancer Report 2014

Données projetées de l'incidence des cancers en France, 2015

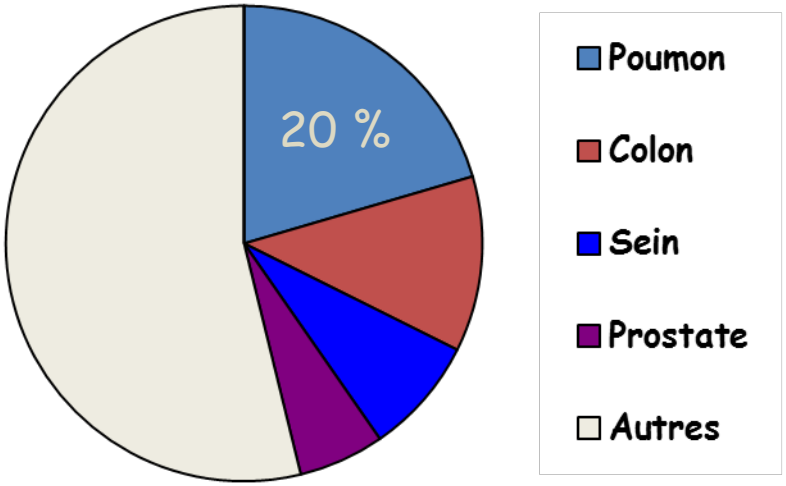


- Sein: 54 062cas
- Prostate: 53 913 cas (évaluation 2011)
- Poumon: 45 222 cas
- Colon-rectum: 43 068 cas
- Autres: 188 177 cas (hors lymphomes)

TOTAL: 384 442 CAS

www.e-cancer.fr (2015)

Nombres projetés des décès par cancer en France, 2015



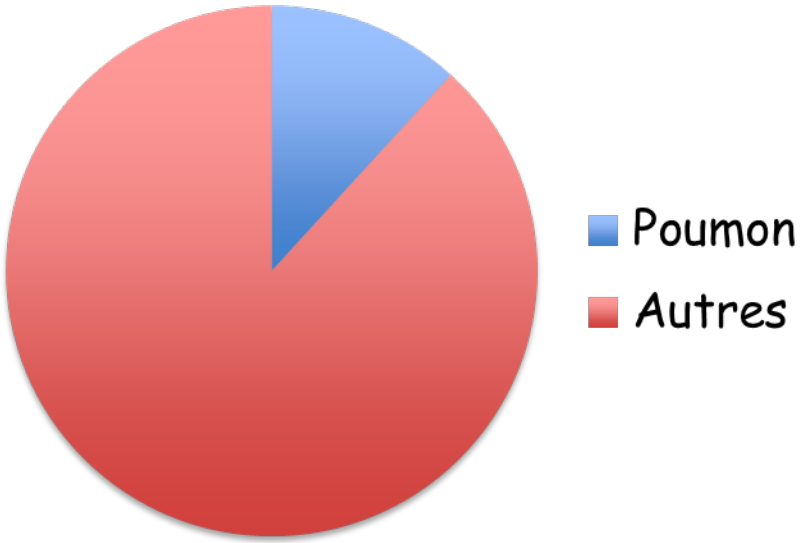
- Poumon: 30 555
- Colon-rectum: 17 833
- Sein: 11 913
- Prostate: 8 713
- Autres: 80 442

TOTAL: 149 456

www.e-cancer.fr
(2015)

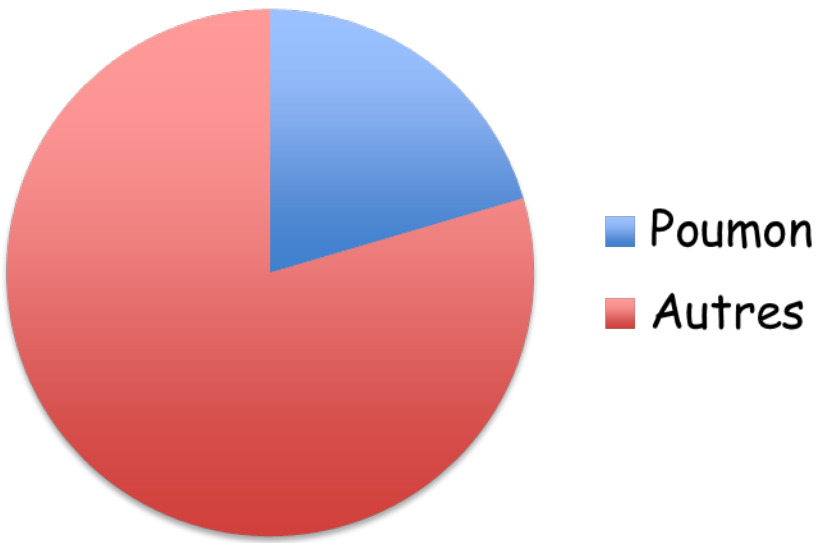
Part relative des cancers du poumon parmi les autres cancers, France, 2015

12 %



INCIDENCE

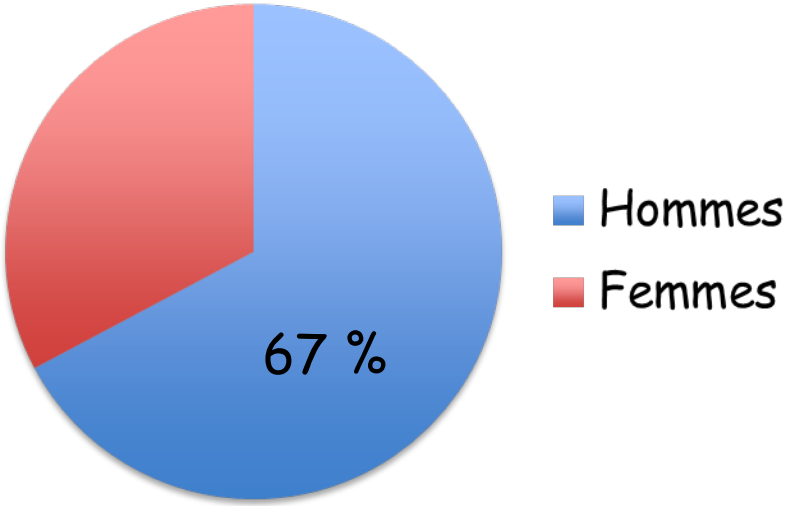
20 %



MORTALITÉ

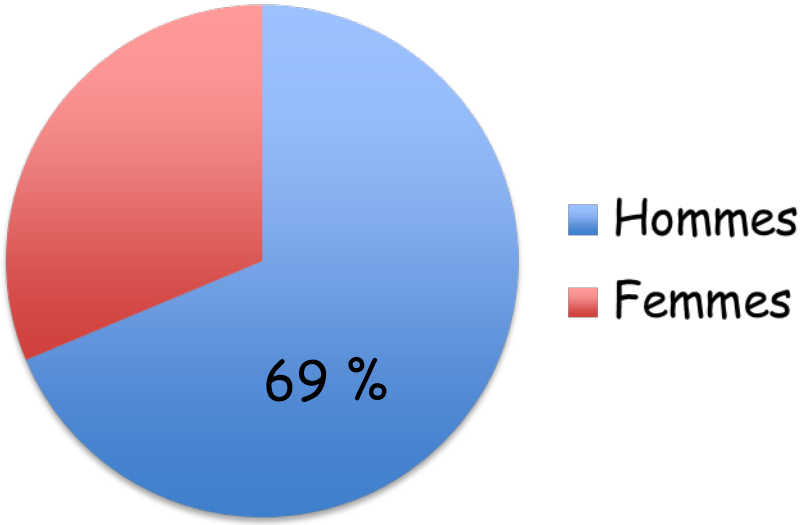
www.e-cancer.fr (2015)

Cancer du poumon en France en 2015 : sexe ratio



INCIDENCE

(45 222 cas)



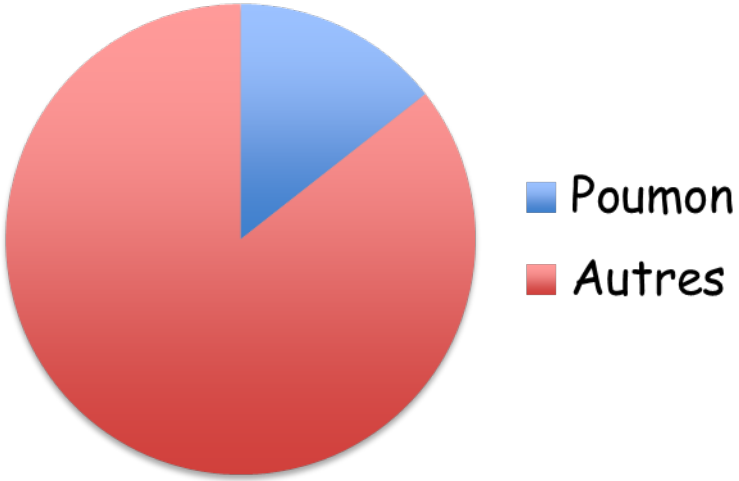
MORTALITÉ

(30 555 décès)

www.invs.sante.fr (2011)

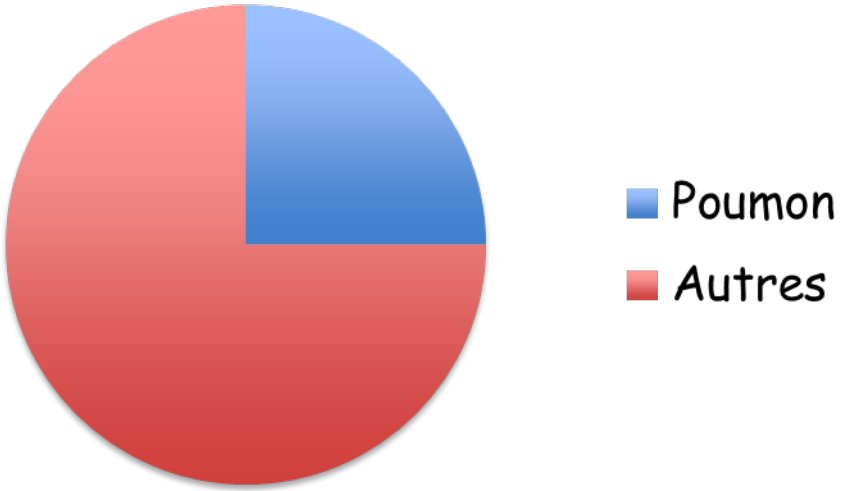
Part relative des cancers du poumon parmi les autres cancers chez l'homme, France, 2015

14 %



INCIDENCE

25 %

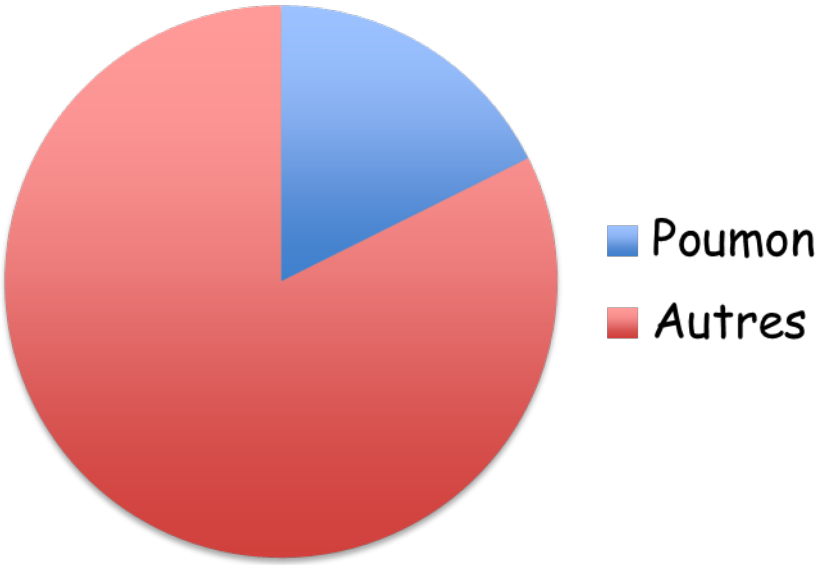


MORTALITÉ

www.e-cancer.fr (2015)

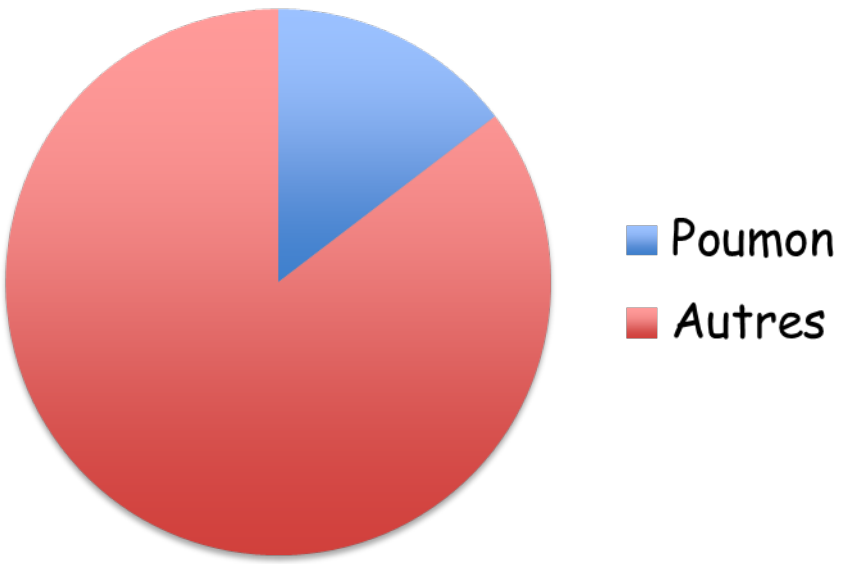
Part relative des cancers du poumon parmi les autres cancers chez la femme, France, 2015

18 %



INCIDENCE

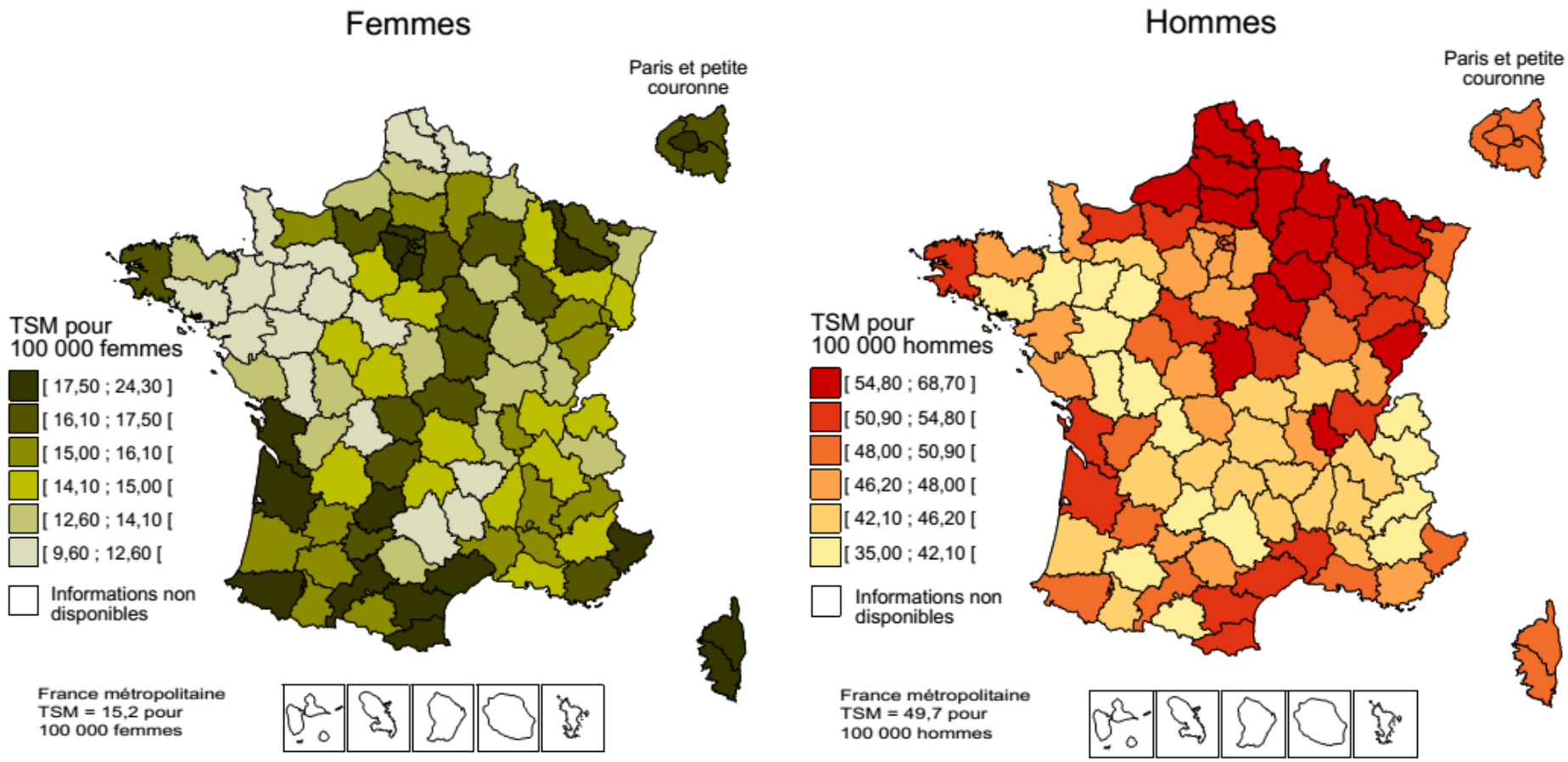
15 %



MORTALITÉ

www.e-cancer.fr (2015)

[Figure 9] Taux standardisés à la population mondiale (TSM) d'incidence des cancers du poumon à l'échelle départementale en France métropolitaine selon le sexe en 2008-2010



Source : Partenariat Francim-HCL-InVS-INCa : [Colonna M, 2015]. Infographie : INCa 2014

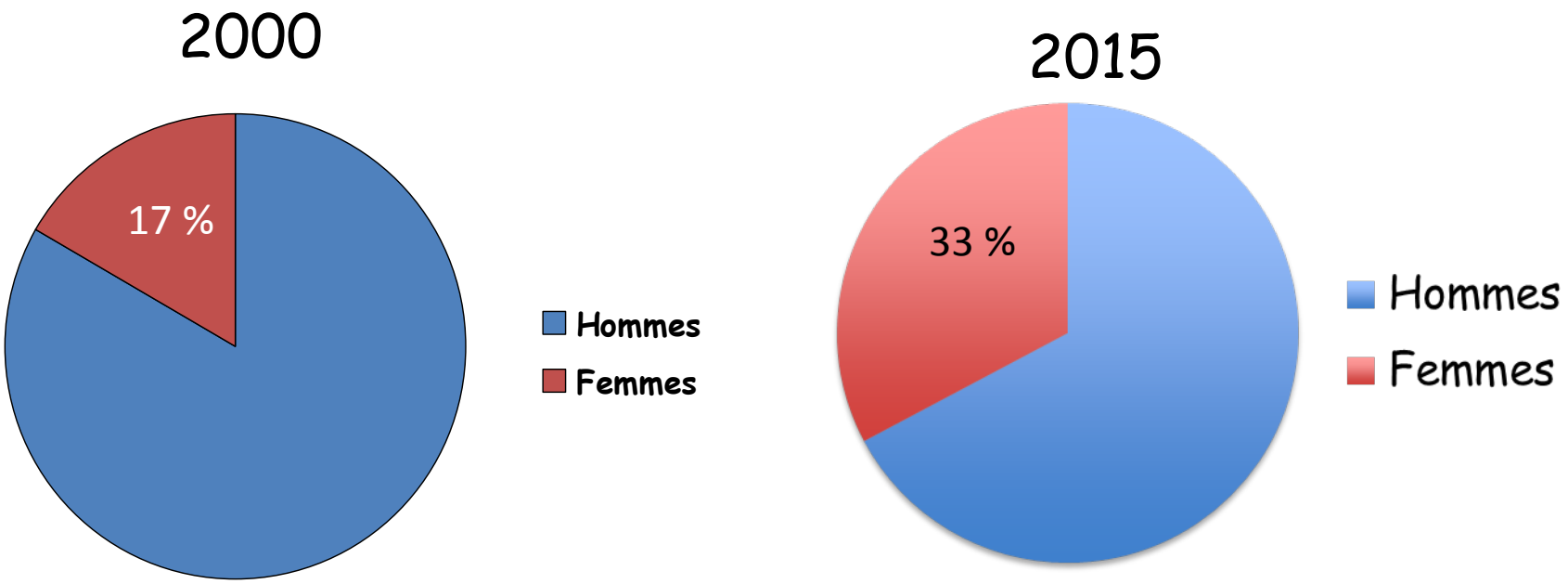
www.e-cancer.fr (2015

Âge médian au diagnostic en 2012 = 66 ans chez l'homme et 65 ans chez la femme.

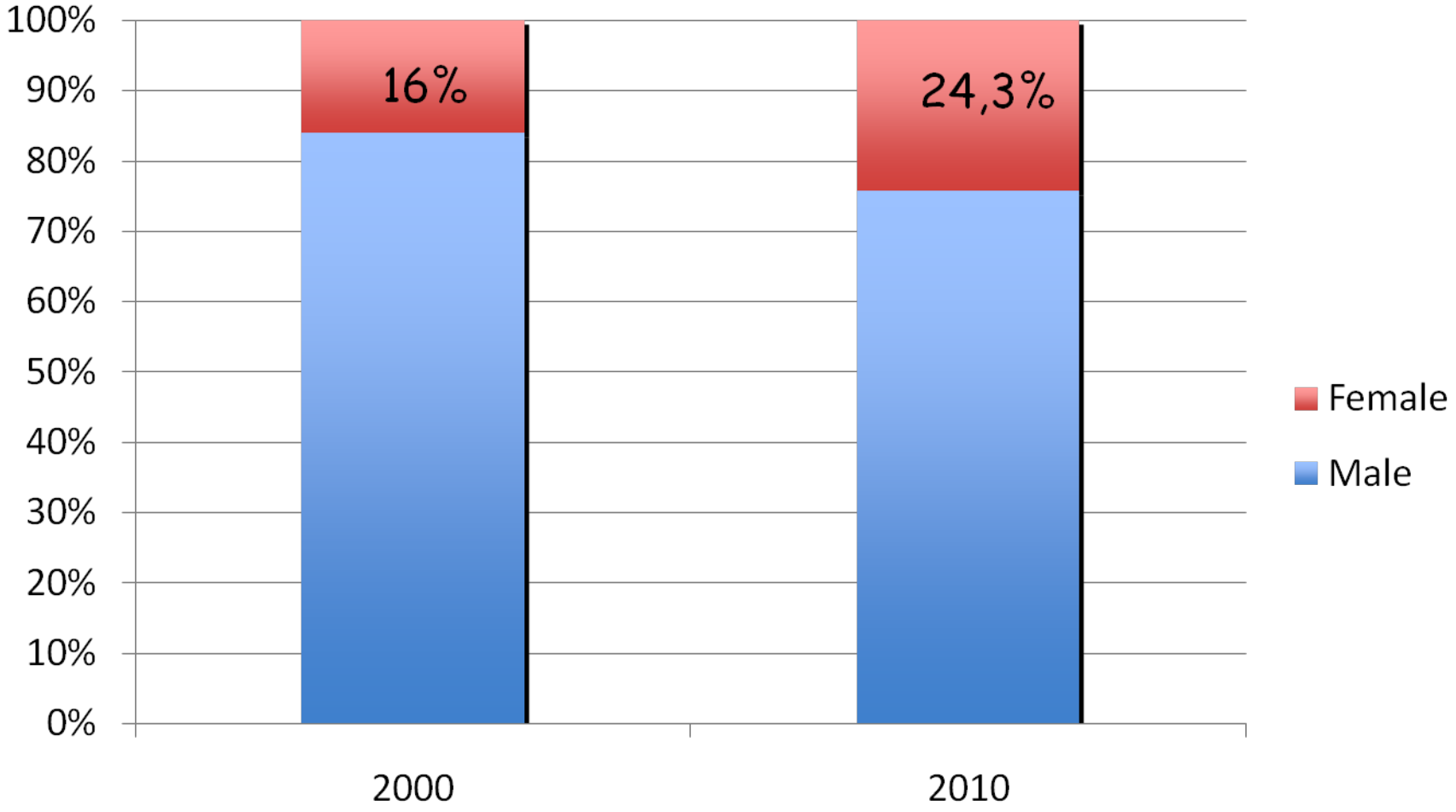
Âge médian au décès en 2012 = 68 ans chez l'homme et 67 ans chez la femme.

www.e-cancer.fr (2015)

Cancer du poumon, France, sexe ratio, 2000-2015



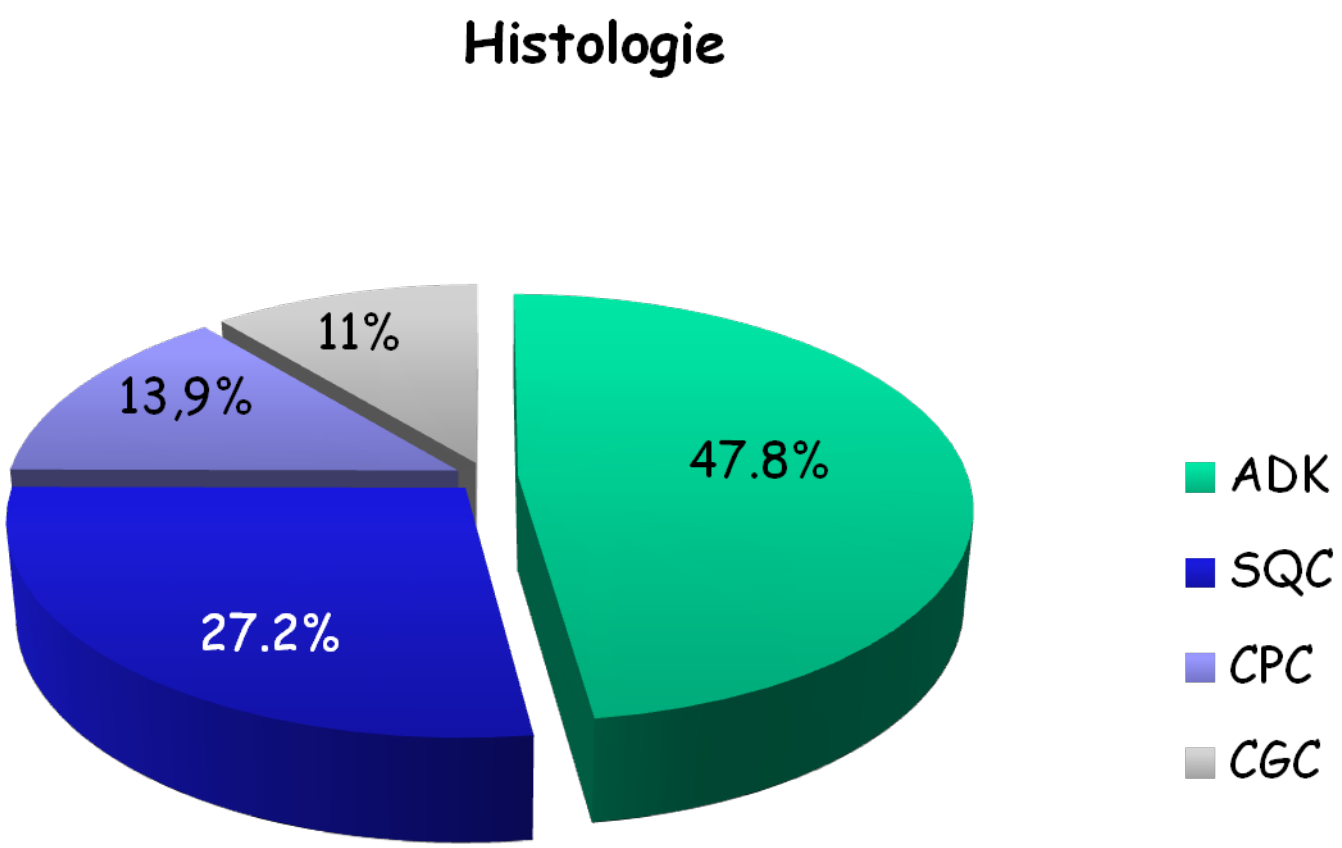
Major changes in lung cancer over the last ten years in France: The KBP-CPHG studies



(n = 5667) (n = 7051)

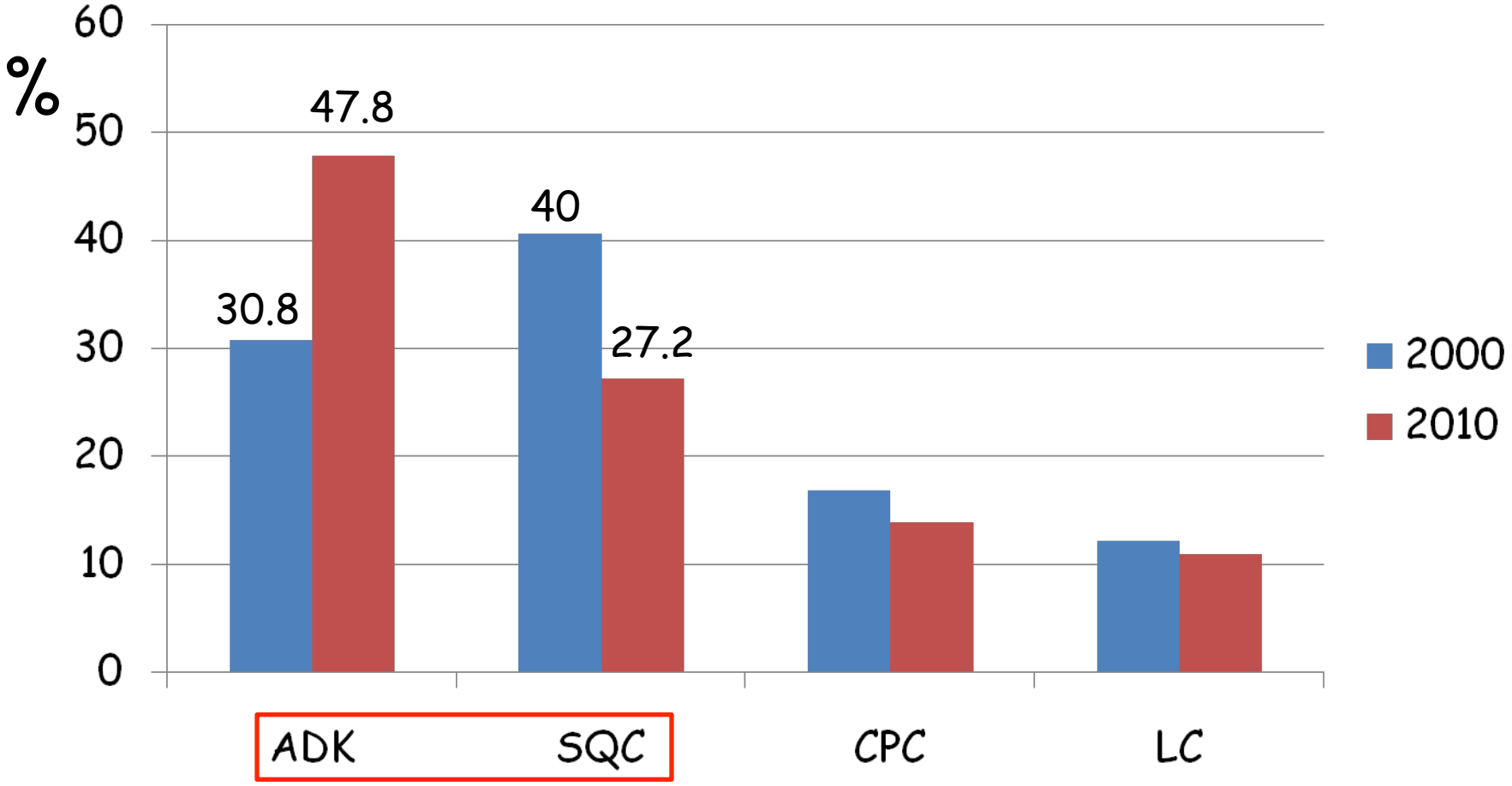
Lung Cancer 2013; 81: 32-38.

Etude KBP-2010-CPHG



Lung Cancer 2013; 81: 32-38.

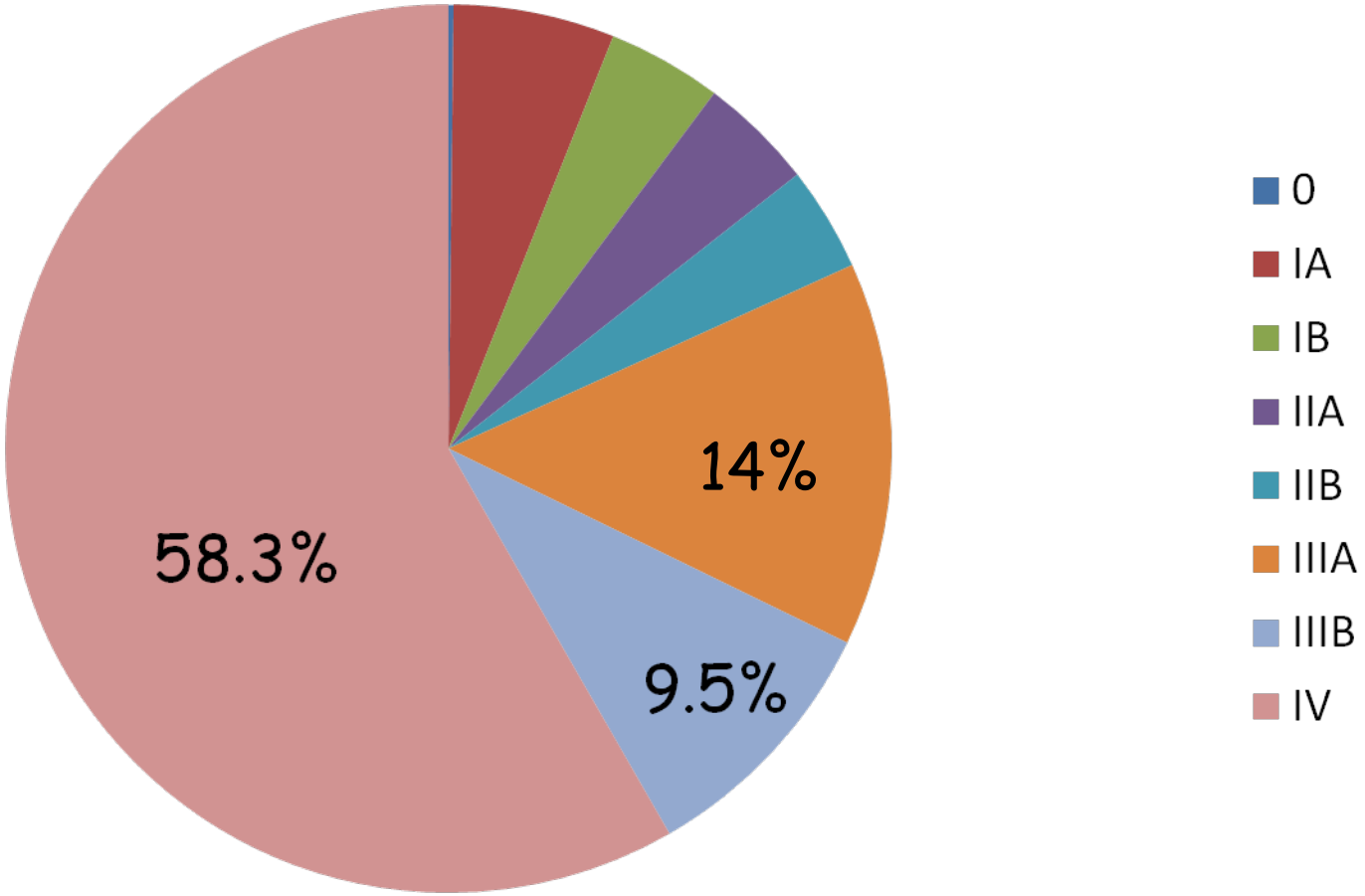
Variations histologiques au cours du temps: KBP 2000 vs KBP 2010



Lung Cancer 2013; 81: 32-38.

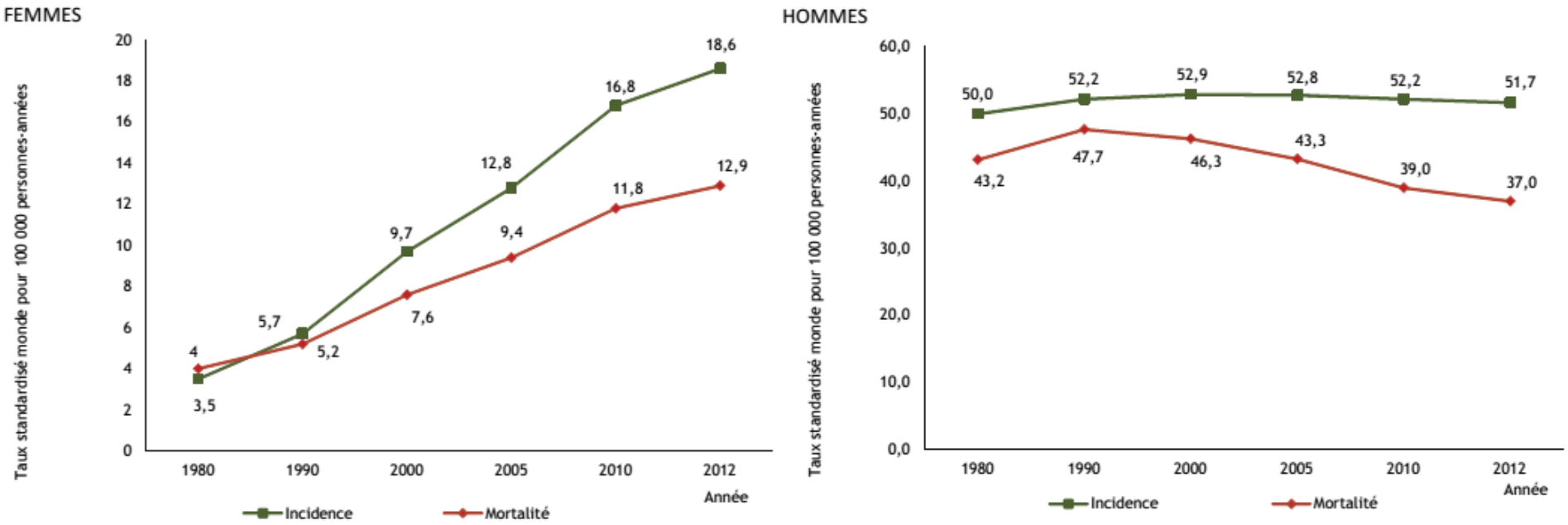
Major changes in lung cancer over the last ten years in France: The KBP-CPHG studies

Répartition par stades (NSCLC seulement) en 2010:



Lung Cancer 81 (2013) 32–38

[Figure 8] Évolution de l'incidence et de la mortalité (taux standardisé monde estimé) par cancer du poumon selon le sexe de 1980 à 2012



Sources : Partenariat Francim-HCL-InVS-INCa [Binder-Foucard F, 2013.]. Traitement : INCa 2013

www.e-cancer.fr (2015)

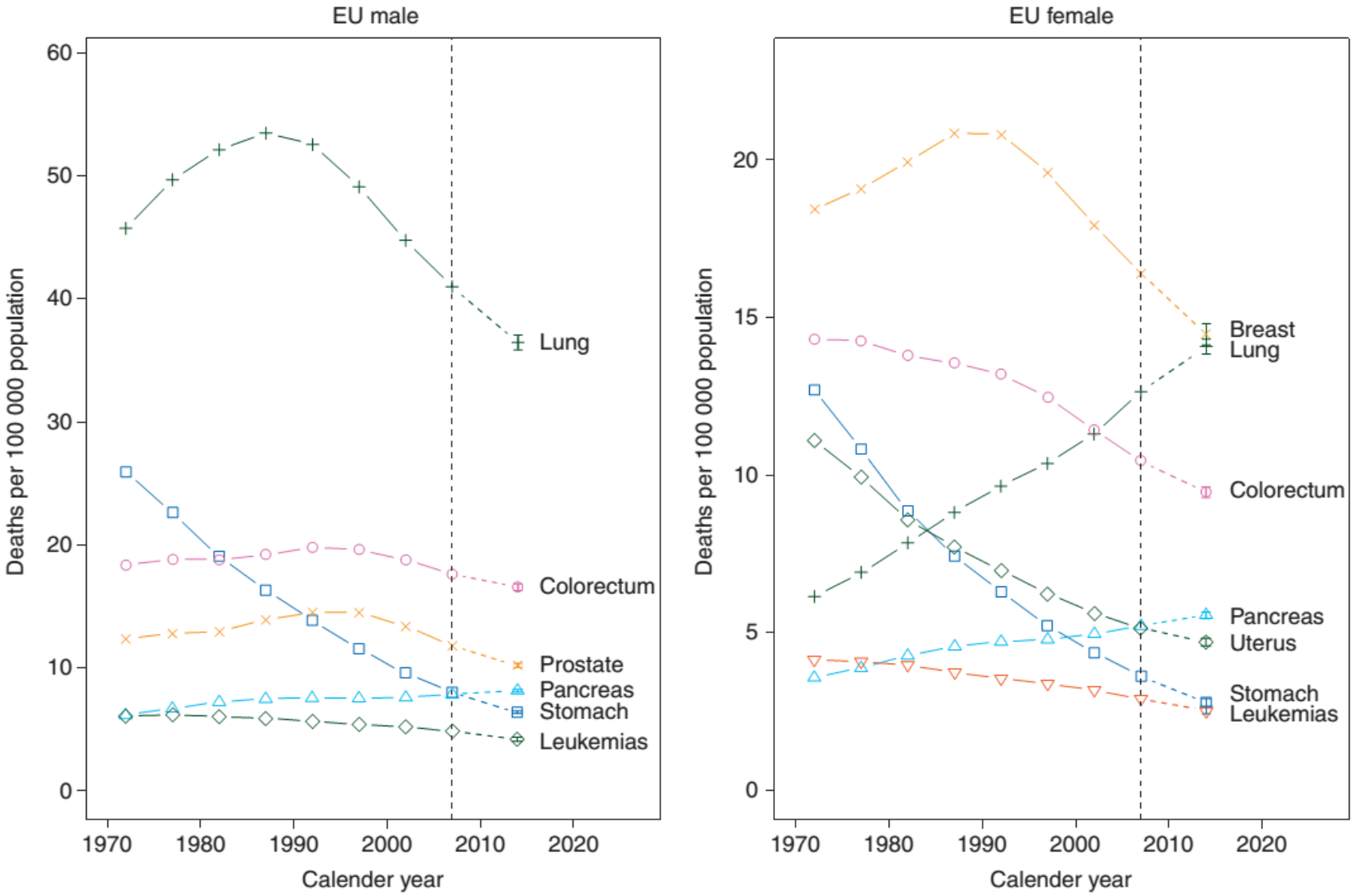
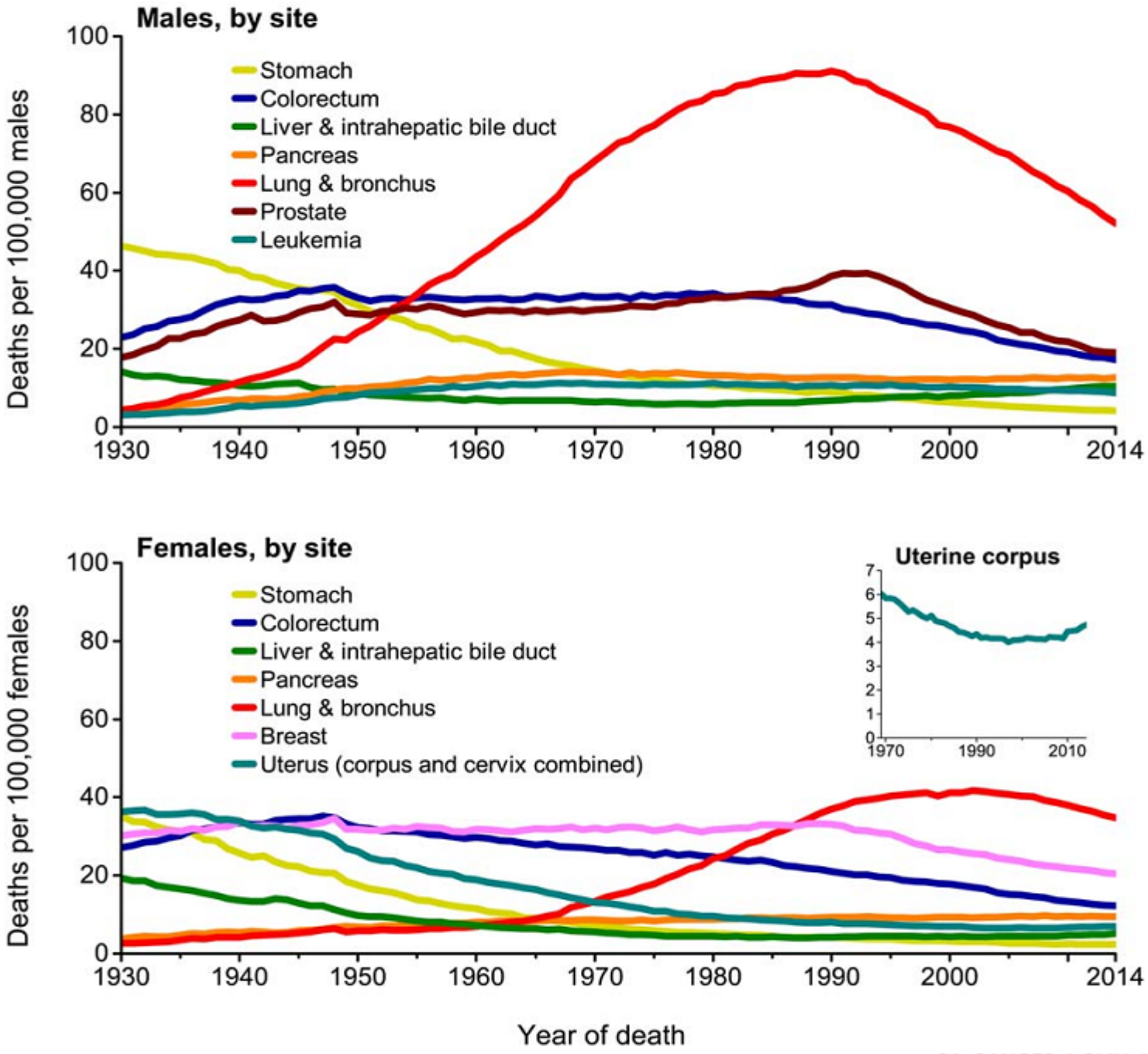


Figure 3. Age-standardized (world population) EU male and female cancer mortality in quinquennia from 1970–1974 to 2005–2009 and predicted rates for 2014. Men: stomach (squares), colorectum (circles), pancreas (triangles), lung (crosses), prostate (x's) and leukemias (diamonds). Women: stomach (squares), colorectum (circles), pancreas (triangles), lung (crosses), breast (x's), uterus (diamonds) and leukemias (inverted triangles).



CA CANCER J CLIN 2017;67:7–30

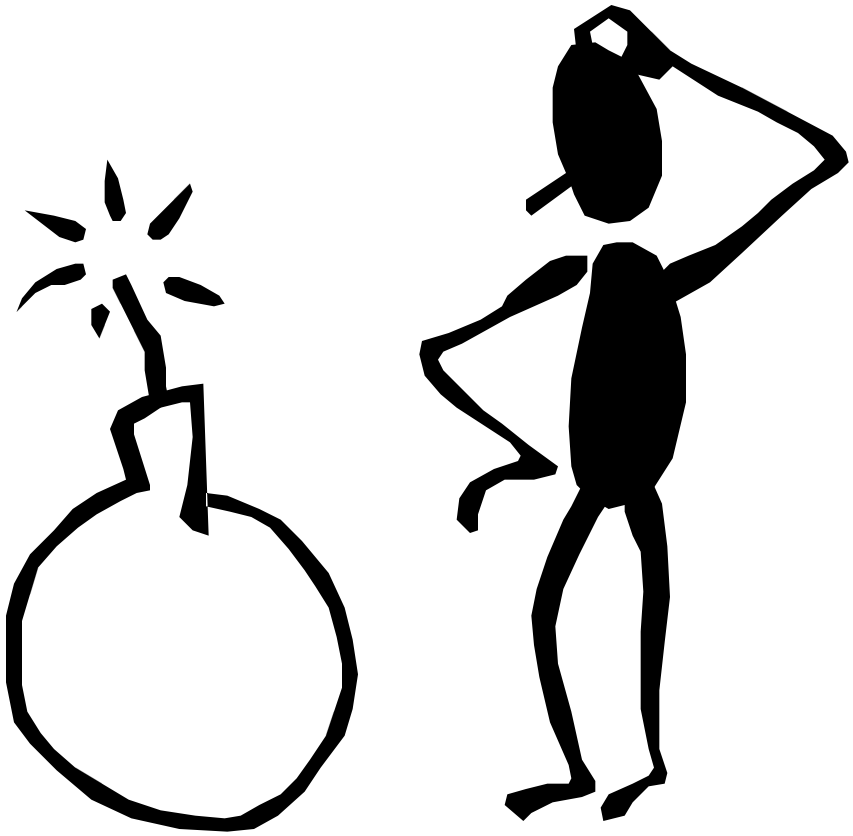
- Survie nette standardisée sur l'âge :
  – à 5 ans sur la période 2005-2010 :
  17 % (20 % chez la femme et 16 % chez l'homme) ;
  – à 10 ans sur la période 1989-2010 : 10 %
  (13 % chez la femme et 9 % chez l'homme).

- Prévalence partielle à 5 ans :
  48 837 (35 690 hommes et 145,9 pour
  100 000 ; 13 147 femmes et 49,7/100 000) ;
  à 10 ans : 62 761 dont 73 % d'hommes
  (188,2/100 000 hommes et 63,3/100 000 femmes)
  et la prévalence totale : 79 470 dont 76 %
  d'hommes en 2008.

www.e-cancer.fr (2015)

Les 10 principales causes de cancer bronchique

- ✓ 1 - cigarette
- ✓ 2 - cigarette
- ✓ 3 - cigarette
- ✓ 4 - cigarette
- ✓ 5 - cigarette
- ✓ 6 - cigarette
- ✓ 7 - cigarette
- ✓ 8 - cigarette
- ✓ 9 - cigarette
- ✓ 10 - cigarette,... autre



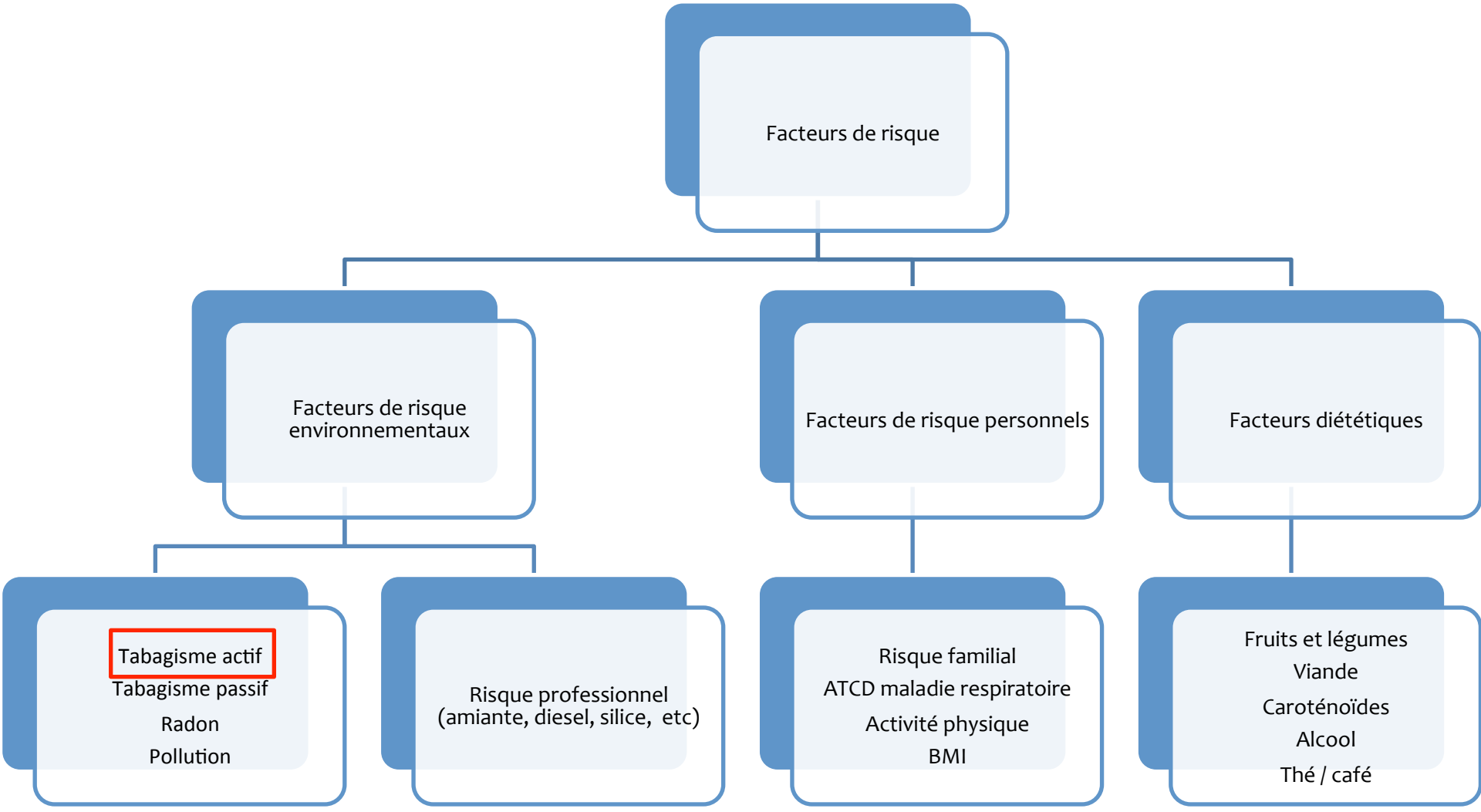
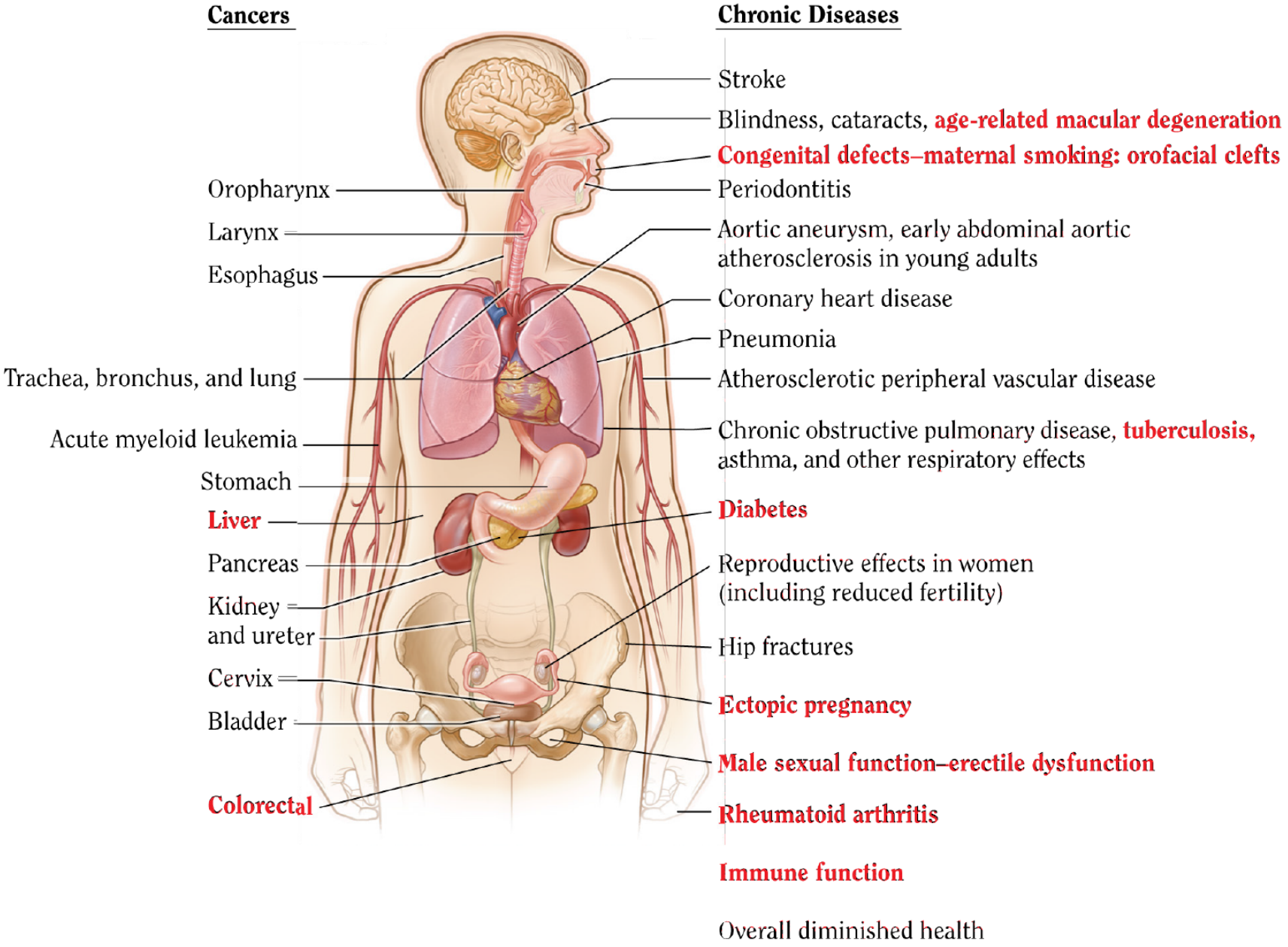

Facteurs de risque
Facteurs de risque environnementaux
Facteurs de risque personnels
Facteurs diététiques
Tabagisme actif
Tabagisme passif
Radon
Pollution
Risque professionnel (amiante, diesel, silice, etc)
Risque familial
ATCD maladie respiratoire
Activité physique
BMI
Fruits et légumes
Viande
Caroténoïdes
Alcool
Thé / café

Figure 1.1A The health consequences causally linked to smoking



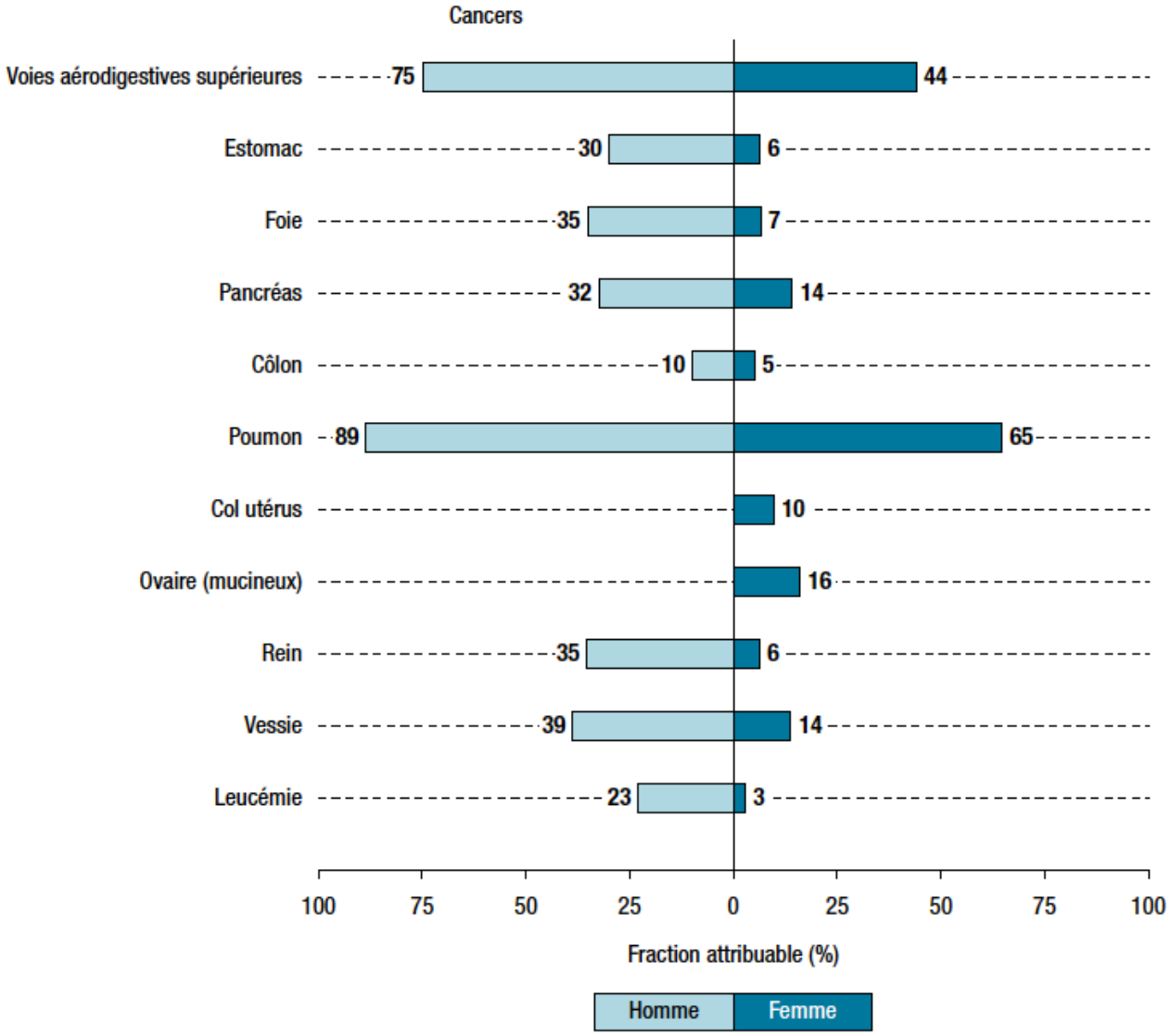
Source: USDHHS 2004, 2006, 2012.
Note: The condition in **red** is a new disease that has been causally linked to smoking in this report.

LES DÉCÈS ATTRIBUABLES AU TABAGISME EN FRANCE. DERNIÈRES ESTIMATIONS ET TENDANCE, ANNÉES 2000 À 2013

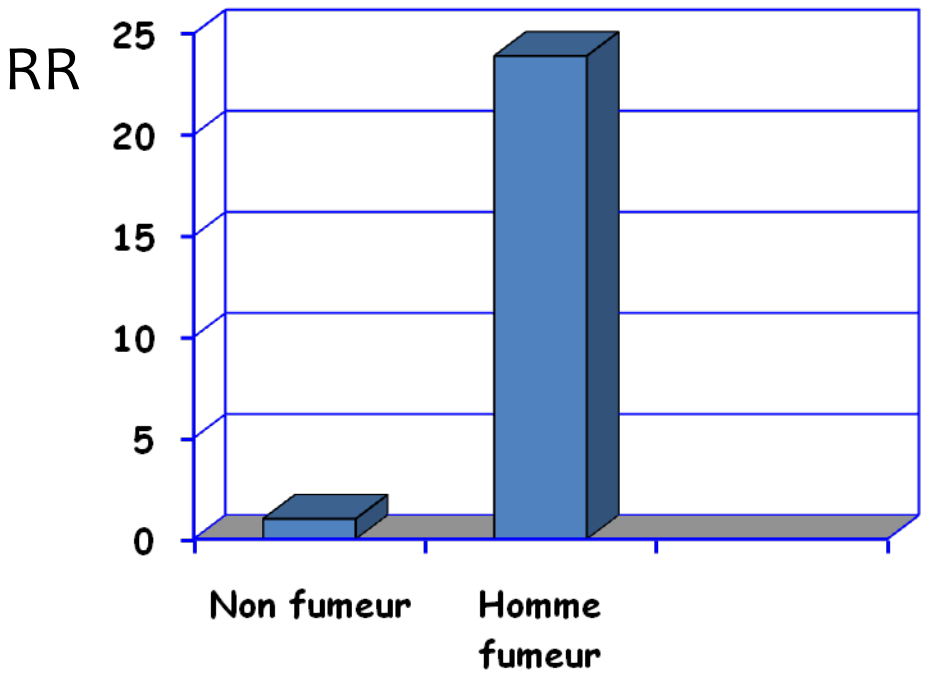
2013: > 73 000 décès attribuables au tabagisme (13,2%)

Cancers: > 45 000 (62,3%)
(30 555 décès par cancer bronchique)
Hommes: 36 947
Femmes: 8632

Fractions des décès attribuables au tabagisme selon la localisation cancéreuse. Estimation pour la France métropolitaine dans la population âgée de 35 ans et plus, année 2013



Lung cancer and cigarette smoking in Europe: an update of risk estimates and an assessment of inter-country heterogeneity.



- 10 études cas-témoins, conduites dans 6 pays européens,
- 7609 cancers et 10431 témoins,
- **Risque relatif de cancer du poumon chez les fumeurs par rapport aux non fumeurs:**
  - **Chez l'homme: 23,9**

Simonato et al. Int J Cancer 2001;91:876-87.

Risque relatif de cancer du poumon chez les femmes fumeuses par comparaison aux non-fumeuses

- Cohorte de 1,2 million de femmes anglaises suivies 12 ans

	Number of deaths		RR (95% CI)
	Current smoker	Never smoker	
Chronic lung disease (J40–44)	1789	121	35·3 (29·2–42·5)
Cancer of lung (C34)	5633	698	21·4 (19·7–23·2)

Lancet 2013; 381: 133–41

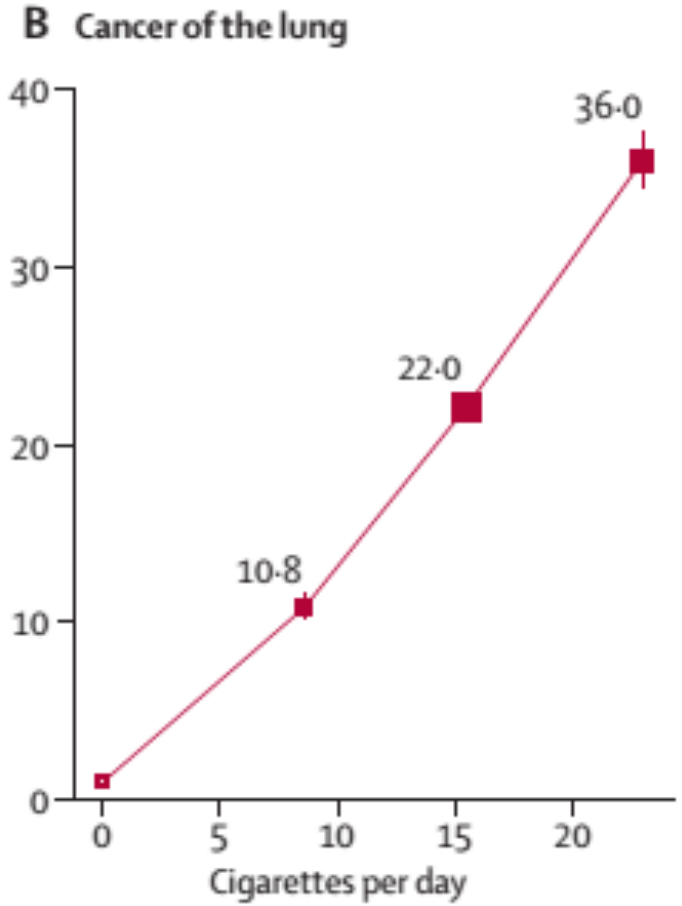
Systematic review with meta-analysis of the epidemiological evidence in the 1900s relating smoking to lung cancer

- 287 études
- RR:
  - Ever smoking: 5,50 (5,07-5,96)
  - Current smoking: 8,43 (7,63-9,31)
  - Past smoking: 4,30 (3,93-4,71)
  - SQC: 16,91 (13,14-21,76)
  - ADK: 4,21 (3,32-5,24)

Lee *et al. BMC Cancer* 2012, **12**:385

Les déterminants du risque de cancer bronchique associé au tabagisme: la consommation quotidienne ou cumulée

- Cohorte de 1,2 million de femmes anglaises suivies 12 ans
- Risque relatif à 12 ans, fumeuses actives versus non-fumeuses, en fonction de la consommation quotidienne: augmentation linéaire du risque



Lancet 2013; 381: 133–41

Les déterminants du risque de cancer bronchique associé au tabagisme: la durée d'exposition au risque

- Doubler la dose de cigarettes (quotidienne ou cumulée) double le risque
- Doubler la durée du tabagisme revient à augmenter le risque d 'un facteur 2^4 (16) à 2^5 (32), disons 20 fois !
- Le risque s'accroit de façon exponentielle avec la durée du tabagisme

C Hill

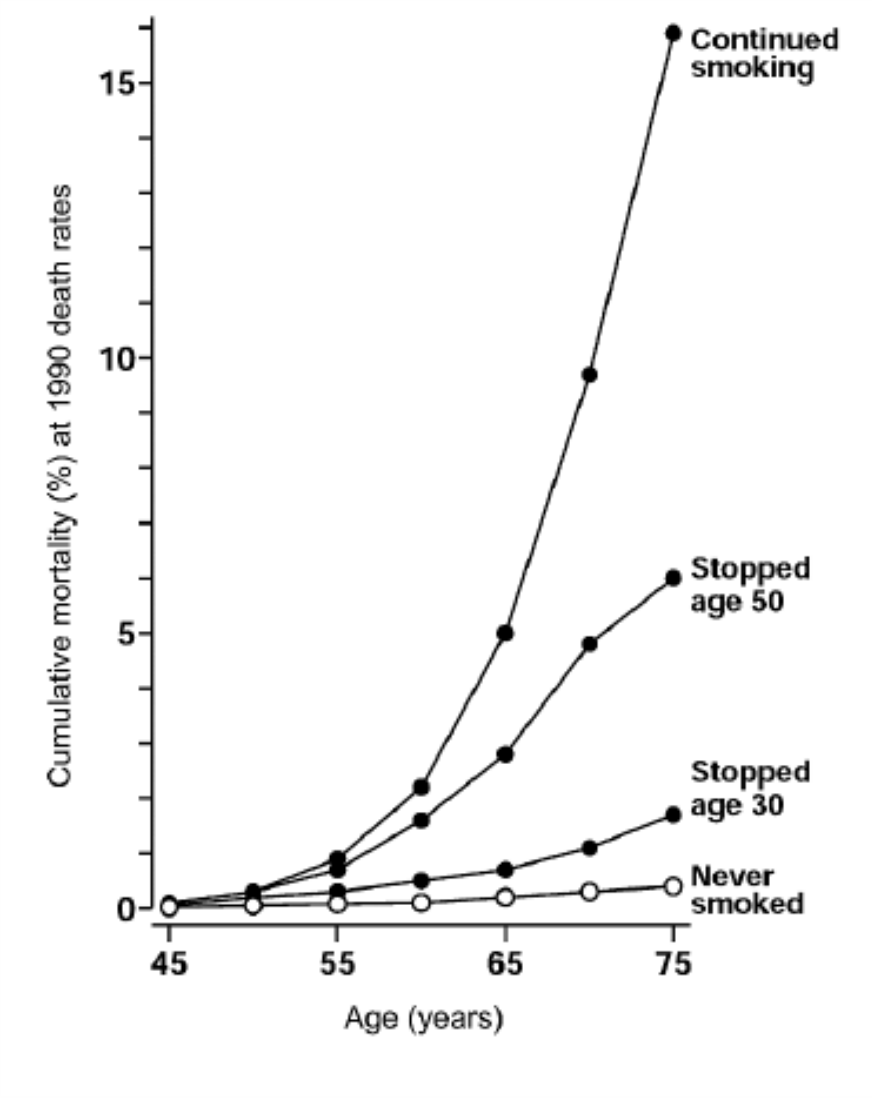
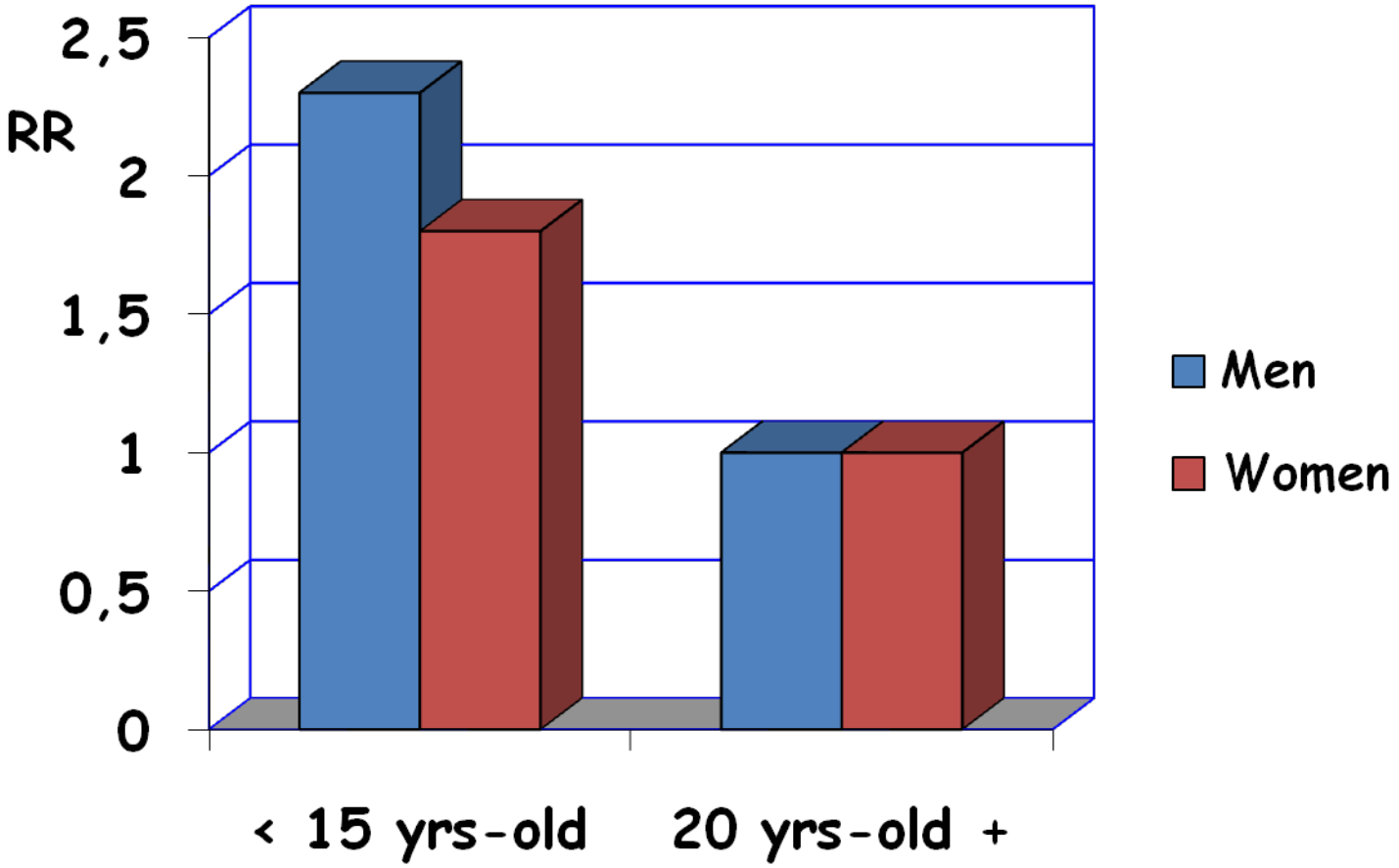


Fig. 2.2.3 *Lung cancer mortality in UK current and former male smokers by age at quitting*
Adapted from Peto *et al.*, 2000

World Cancer Report, IARC, 2008

Effet de l'âge d'initiation du tabagisme sur le risque relatif de cancer du poumon.



Peto et al. Br Med J 2000; 321: 323-9.

Meta-analysis of studies of passive smoking and lung cancer: effects of study type and continent

RR for non-smoking women exposed to passive smoking from spouses: 1,27 (1,17-1,37)

International Journal of Epidemiology 2007;**36**:1048–1059

Lung Cancer Risk and Workplace Exposure to Environmental Tobacco Smoke

RR: 1,24 (1,18-1,29)

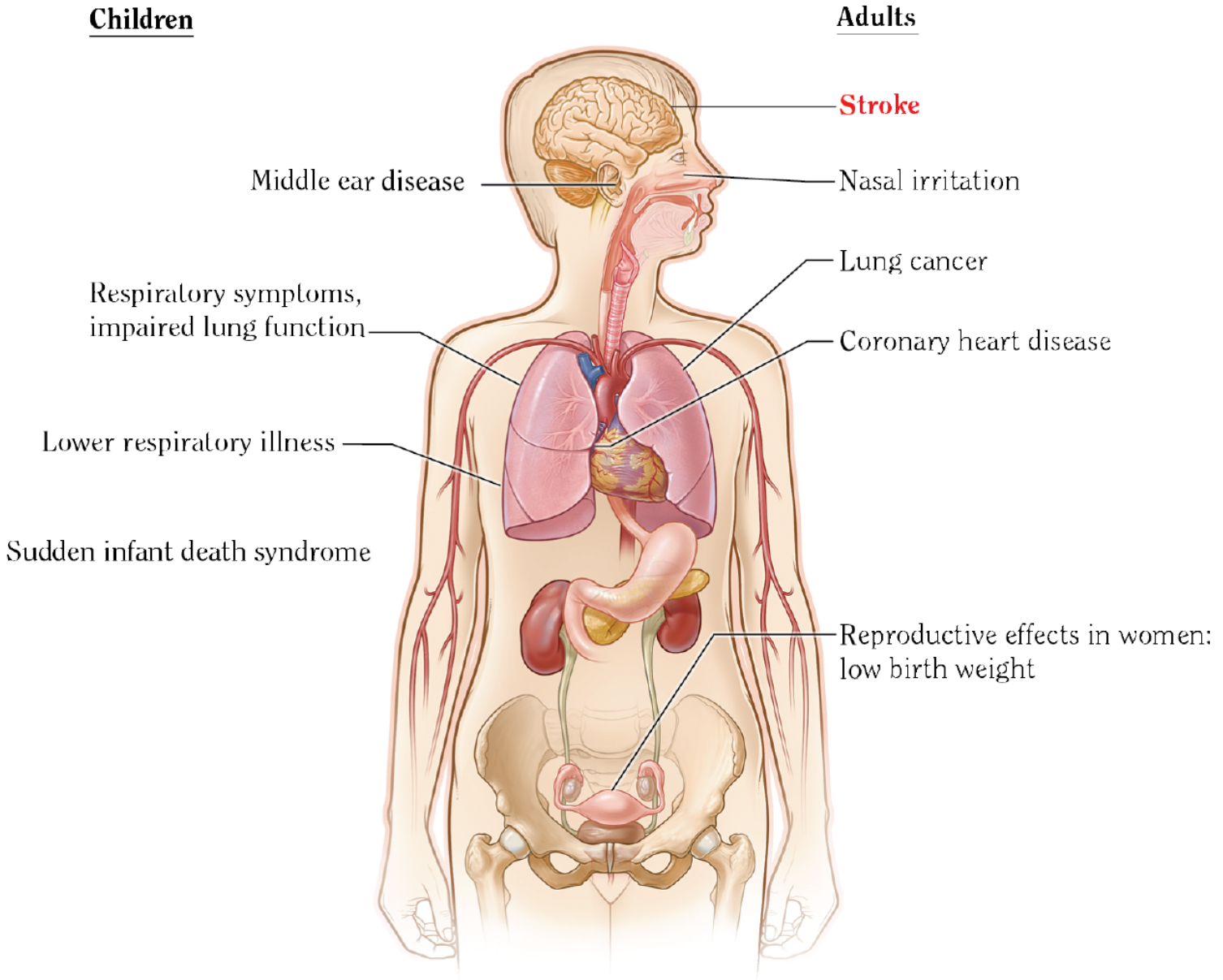
March 2007, Vol 97, No. 3 | American Journal of Public Health

Lung cancers attributable to environmental tobacco smoke and air pollution in non-smokers in different European countries: a prospective study

HR : 1,34 (0,85-2,13)
HR attributable to workplace exposure: 1,65 (1,04-2,63)

Environmental Health 2007, **6**:7

Figure 1.1B The health consequences causally linked to exposure to secondhand smoke



Source: USDHHS 2004, 2006.
Note: The condition in **red** is a new disease that has been causally linked to smoking in this report.

Residential radon and lung cancer risk: an updated meta- analysis of case-control studies.

22 case-control studies of residential radon and lung cancer risk involving 13,380 cases and 21,102 controls
OR of lung cancer for the highest with the lowest exposure: 1.29 (95% CI 1.10-1.51)

Asian Pac J Cancer Prev. 2012;13(6):2459-65.

Attributable risk of lung cancer deaths due to indoor radon exposure

Worldwide, 3-20% of all lung cancer deaths are likely caused by indoor radon exposure.

Kim *et al. Annals of Occupational and Environmental Medicine* (2016) 28:8

Lung Cancer Attributable to Indoor Radon Exposure in France: Impact of the Risk Models and Uncertainty Analysis

Estimated number of lung cancer deaths attributable to indoor radon exposure in France: 543 to 3108

Environmental Health Perspectives • VOLUME 114 | NUMBER 9 | September 2006

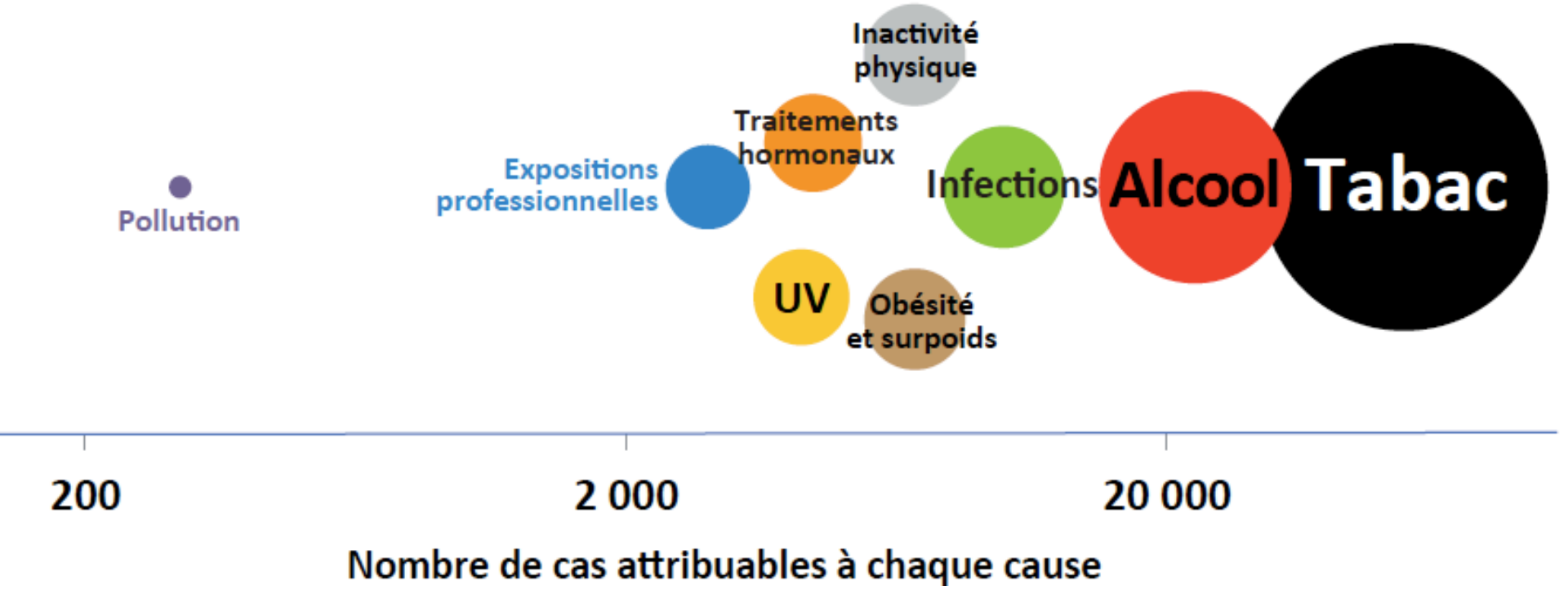
Air pollution is a complex mixture of variant gases (SO_2, NO_2, Nox, O3, PM2,5) which are mostly emitted by diesel vehicles.

An evidence-based assessment for the association between long-term exposure to outdoor air pollution and the risk of lung cancer

The risk of lung cancer mortality or morbidity increased:
-7.23 (95% CI: 1.48-13.31) % / 10 µg/m increase in fine particles (PM2.5),
-13.17 (95% CI: 5.57-21.30) % / 10 parts per billion (ppb) increase in nitrogen dioxide (NO_2),
-0.81 (95% CI: 0.14-1.49) % / 10 ppb increase in nitrogen oxides (NOx),
-and 14.76 (95% CI: 1.04-30.34) % / 10 ppb increase in sulfur dioxide (SO_2).
There was a null association for carbon monoxide and ozone.

European Journal of Cancer Prevention 2016, **25**:163–172

Nombre de cas de cancers attribuables aux différents facteurs de risque de cancer en France en 2000.



The Global Burden of Disease Due to Occupational Carcinogens

Occupational carcinogen	Outcome
Arsenic, asbestos, beryllium, cadmium, chromium, diesel exhaust, nickel, silica	Cancer of the trachea, bronchus or lung
Benzene, ethylene oxide, ionizing radiation	Leukemia
Asbestos	Malignant mesothelioma

Worldwide: it is estimated that, in the year 2000, 10% of lung cancer deaths among men (88 000 deaths) and 5% among women (14 300 deaths) could be attributed to 8 occupational lung carcinogens.

AMERICAN JOURNAL OF INDUSTRIAL MEDICINE 48:419–431 (2005)

An Estimate of Cancers Attributable to Occupational Exposures in France

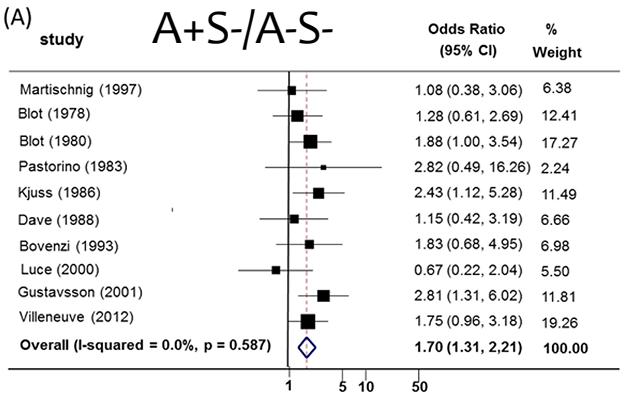
TABLE 6. Total Number of Cancers Attributable to Occupational Exposures, by Gender

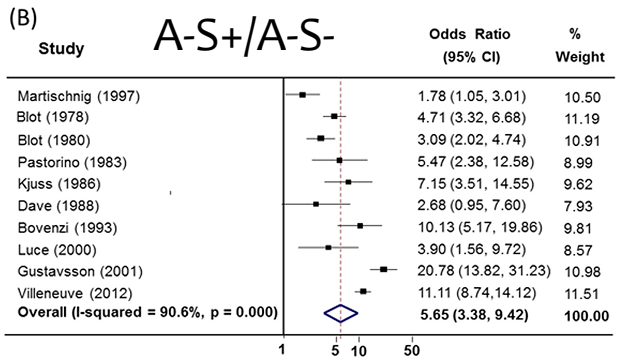
	Men			Women			Total	
Cancer	**AF%**	**Cases**	**Deaths**	**AF%**	**Cases**	**Deaths**	**Cases**	**Deaths**
Lung	12.5	2884	2564	6.5	295	274	3179	2838
Mesothelioma	83.2	558	504	38.4	77	62	635	566
Bladder	5.5	497	180	0.6	10	6	507	186
Leukemia	4.1	148	110	0.4	10	9	158	119
Larynx	3.1	120	53	0.3	1	0	121	53
Sinonasal	24.3	128	24	6.5	10	3	138	27
Skin SCC	2.2	NA	5	0.1	NA	<1	NA	5
Totals		4335	3440		403	354	4738	3794
% all cancers		2.7	4.0		0.3	0.6		

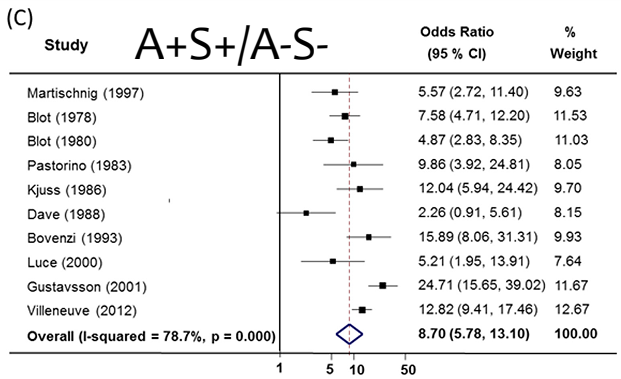
Year 2000:

11,3% men and 4,2% women lung cancer cases could be attributed to known occupational carcinogens.

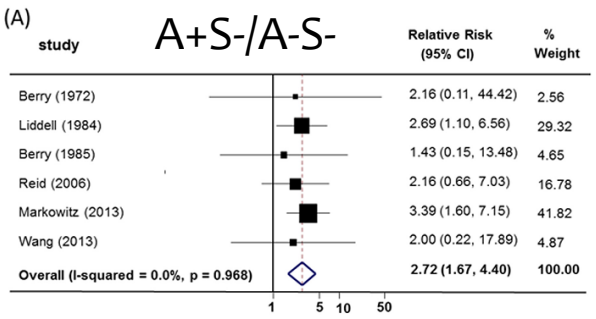
JOEM • Volume 52, Number 4, April 2010

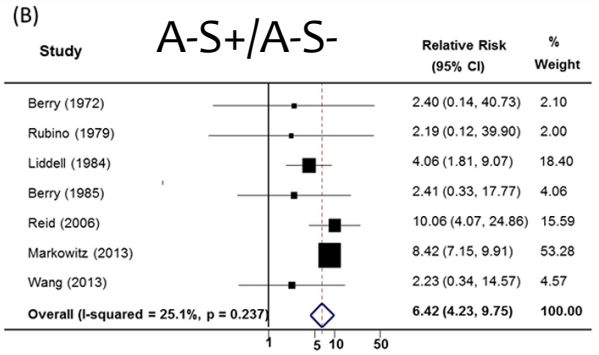


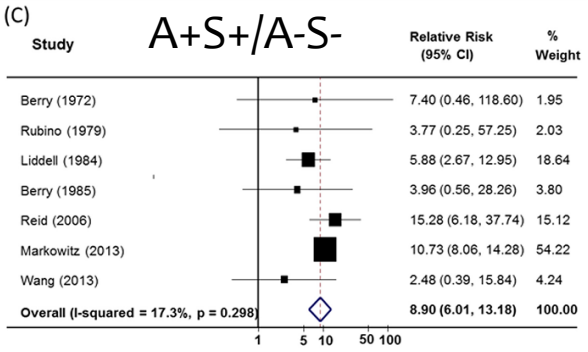




Case-control studies







Cohort studies

PLOS ONE | DOI:10.1371/journal.pone.0135798 August 14, 2015

Diesel exhaust

- Pooled analysis of case-control studies
- 13 304 cases, 16 282 controls
- OR : 1,31 (1,19-1,43)

Am J Respir Crit Care Med 2011; 183: 941-8

Silica

Cohort studies: RR: 1,34 (1,25-1,57)

Case-control studies: RR: 1,41 (1,18-1,67)

Ann Oncol 2006; 17: 1039-50

Familiarity

- Review of 28 case-control, 17 cohort and 7 twin studies: pooled RR for individuals having an affected relative: 1,84 (1,64-2,05)

  Br J Cancer 2005; 93: 825-33

- Meta-analysis, 40 studies: OR: 1,72 (1,56-1,88)

  Cancer Causes Control 2010; 21: 1091-104

Prior inflammatory diseases

Characteristic	Smoking status			*P*[a] Value
	Smokers	Non-smokers	Not identified	
COPD	3.13(2.02,4.86)	1.40(0.83,2.35)	2.92(1.62,5.25)	<.001
Emphysema	3.27(2.72,3.92)	1.69(1.15,2.46)	3.82(2.51,5.81)	<.001
Chronic bronchitis	2.38(1.45,3.92)	1.54(1.24,1.93)	1.98(1.38,2.83)	<.001
Asthma	0.65(0.29,1.45)	1.53(0.89,2.64)	0.93(0.32,2.71)	<.001

PLoS One. 2012;7(9):e46144

Body fatness

- Meta-analysis, 31 studies
- Excess body weight is inversely associated with lung cancer risk
- Pooled RR: 0,79 (0,73-0,85)

Int J Cancer 2013; 132: 1162-9.

Dietary factors

- Meta-analysis of cohort studies: RR for the highest vs the lowest category of fruit intake: 0,84 (0,79-0,90)

Lung Cancer 2015; 88: 124-30.

- Vegetables: non significant reduced risk

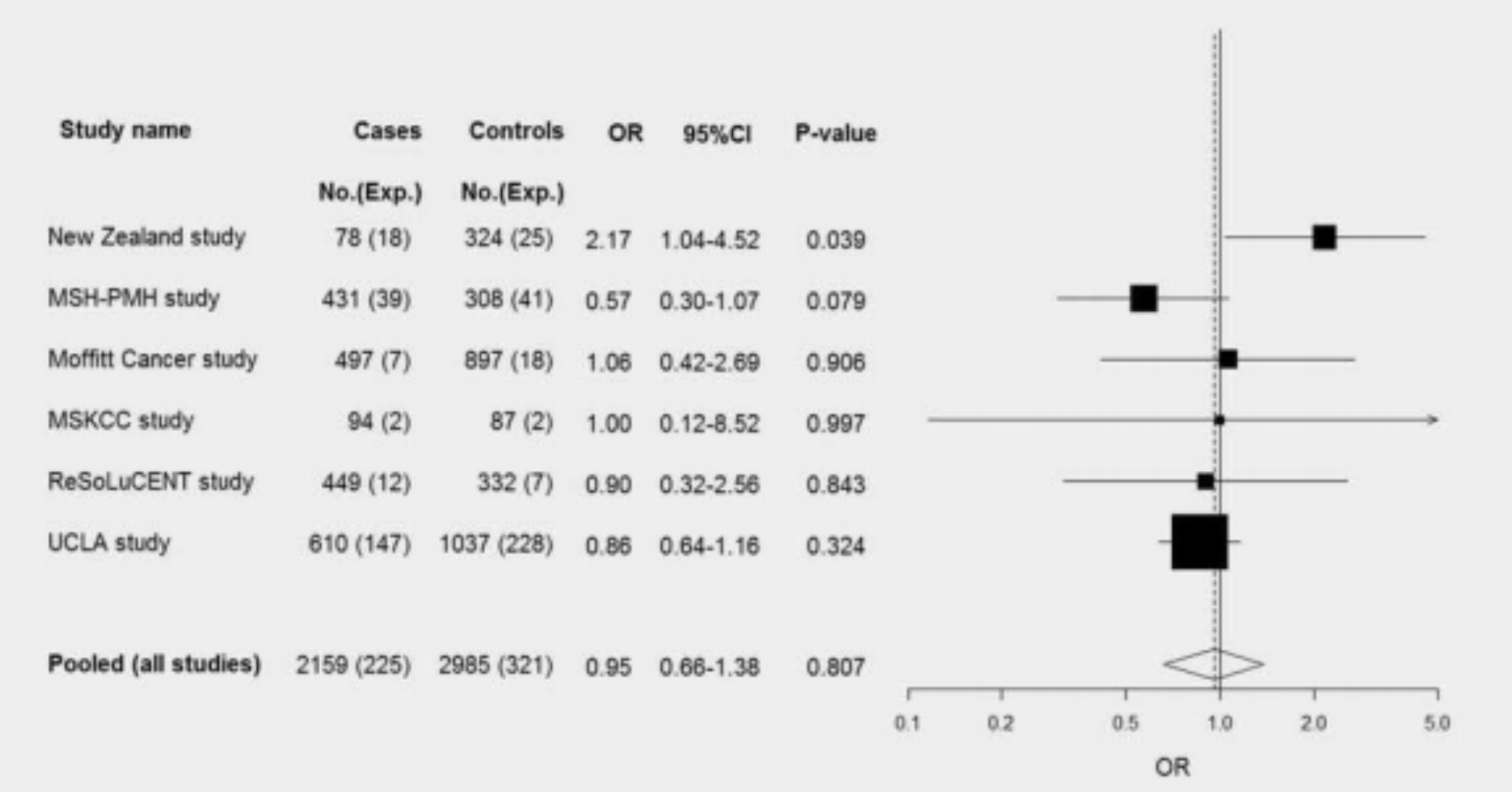
Int J Cancer 2003; 107: 1001-11

Table 2. Level of Confidence in the Evidence for Adverse Effects of Marijuana on Health and Well-Being.

Effect	Overall Level of Confidence*
Addiction to marijuana and other substances	High
Abnormal brain development	Medium
Progression to use of other drugs	Medium
Schizophrenia	Medium
Depression or anxiety	Medium
Diminished lifetime achievement	High
Motor vehicle accidents	High
Symptoms of chronic bronchitis	High
Lung cancer	Low

NEJM 2014; 370: 2219-2227.

Cannabis smoking and lung cancer risk: Pooled analysis in the International Lung Cancer Consortium

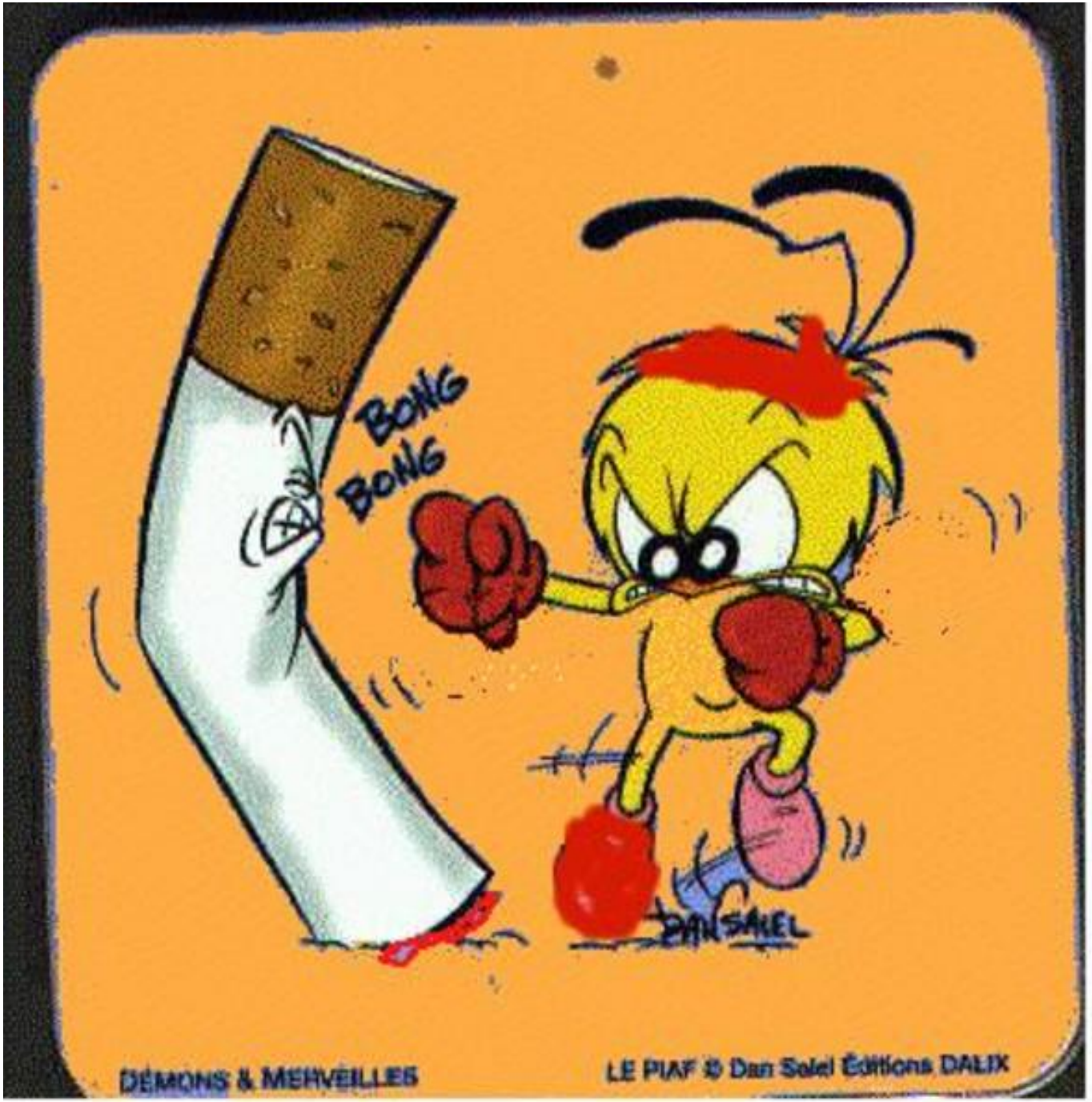


Forest plot of the association between cannabis smoking (habitual *vs.* nonhabitual) and lung cancer risk.

WELCA

Santé publique Inserm
Institut national de la santé et de la recherche médicale

« Etude du rôle des facteurs hormonaux et reproductifs et des facteurs d'expositions professionnelles sur la santé des femmes »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