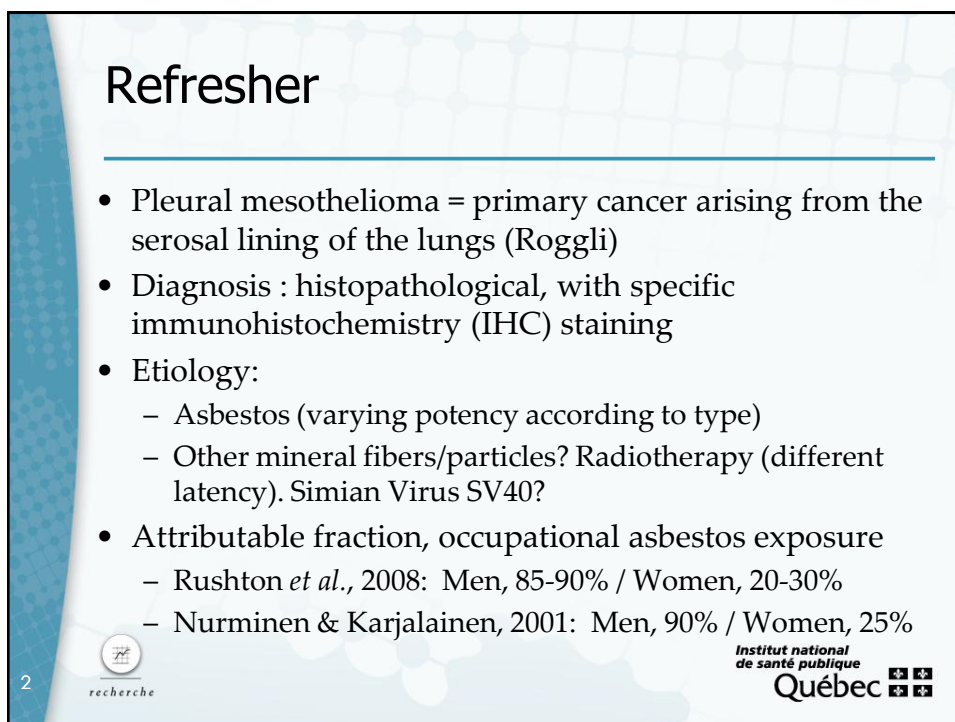# Mesothelioma surveillance: validation of diagnoses from a tumour registry

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Refresher

- Pleural mesothelioma = primary cancer arising from the serosal lining of the lungs (Roggli)
- Diagnosis : histopathological, with specific immunohistochemistry (IHC) staining
- Etiology:
  - Asbestos (varying potency according to type)
  - Other mineral fibers/particles? Radiotherapy (different latency). Simian Virus SV40?
- Attributable fraction, occupational asbestos exposure
  - Rushton *et al.*, 2008: Men, 85-90% / Women, 20-30%
  - Nurminen & Karjalainen, 2001: Men, 90% / Women, 25%

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Context of study

- Public health mandate: development of a surveillance program for asbestos-related diseases
- Main sources of data for mesothelioma surveillance:
  - Quebec's Tumour Registry (QTR)
  - Compensation statistics (Commission de la santé et de la sécurité du travail du Québec, CSST)
- Previous study, Québec 1982-1996
  - Compensated cases of pleural mesothelioma = 22.1% of cases from QTR (or, QTR numbers ≈ 4.5 times CSST numbers)
- Proportions questioned by some physicians...
  - Overestimation by QTR? (false positives) – Real cases?

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Study aim & objectives

Validate QTR data for the purpose of pleural mesothelioma surveillance

Main objectives
- Check the correctness of mesothelioma diagnoses as noted in the QTR, with clinical chart review and histopathological review;
- Estimate the importance of an eventual overestimation (« false positives »), in the QTR data.

  N.B. – Underascertainment NOT explored
  – Link with asbestos exposure purposefully excluded

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Methods

- **Descriptive** study (medical chart review)
- **Identification** of all new cases of <u>pleural</u> mesothelioma (ICD-9 163, morphology 905) registered in 2001 & 2002, in the QTR
- Medical chart **summary** for all cases (data extraction notes + photocopies of reports)
- **New revised "diagnosis",** 5 categories definite/probable, possible, unlikely, not a mesothelioma, impossible to classify
- **Pathological review** of histopathological material (new IHC stains if necessary) & 1st coding by pathologist
- **Clinical review** of chart summaries by chest physician & radiologist, during working group sessions & 1st coding
- **Consensus decisions** during group sessions (3 specialists)

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Cases' characteristics

Characteristics	Men		Women		Total	
	n	*%*	**n**	*%*	**n**	*%*
	152	*81.3*	35	*18.7*	187	*100*
Pleural plaques	51	*33.6*	3	*8.6*	54	*28.9*
> 5-year survival	5	*3.3*	2	*5.7*	7	*3.7*
	Mean & *SD*		**Mean & *SD***		**Mean & *SD***	
Age at diagnosis (years)	68.1 *10.2*		62.7 *13.0*		67.1 *10.9*	
Survival after diagnosis (months), n=147	10.5 *14.6*		15.7 *19.9*		11.5 *15.8*	

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Proportion of diagnostic confirmation, QTR data – 2001-2002

	All charts		Satisfactory data			
			Chest MD & radiologist		Pathologist	
	N=187		N=66		N=142	
Code	N	%	N	%	N	%
Definite/probable	109	*61.9*	51	*77.3*	104	*73.2*
Possible	34	*19.3*	7	*10.6*	20	*14.1*
Unlikely	14	*7.9*	1	*1.5*	5	*3.5*
Not a meso	19	*10.8*	7	*10.6*	13	*9.2*
Impossible to classify	11	-	0	-	0	-
Unsatisfactory data			121		45	
Total	187	*100*	187	-	187	-

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Pleural mesothelioma rate estimates 3 calculations – 2001-2002

	Men	Women	Total
QTR numbers	152	35	187
Rate/100,000, QTR	2.084	0.467	1.264
Study numbers, All charts	87	22	109
Rate/100,000, Study, All charts	1.193	0.293	0.737
Relative difference (%), All	74.7	59.1	71.6
Study numbers, Satisfactory path.	110.35	26.57	136.88
Rate/100,000, Study, Satisfactory	1.513	0.354	0.925
Relative difference (%), Satisfactory path.	37.7	31.7	36.6

8 Relative difference : $(IR_{QTR} - IR_{Study})/IR_{Study})$

Discussion

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- Characteristics of pleural mesothelioma cases from the QTR are consistent with known epidemiology (age, sex; type of tumour…)
- Proportion of diagnostic confirmation:
  - All charts: 62% "definite/probable" (+ "possible": 81%)
  - Satisfactory charts: 77% "definite/probable" (+ "possible": 87%)
- Compensation statistics 2001-2003 ≈ 25 per year, i.e. 46% of confirmed QTR cases
- Some under-ascertainment of pleural mesothelioma cases in the QTR: 12% of compensated cases not coded as such + 4% not found in QTR, 1982-2002 [Lebel & Gingras, 2009]

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Discussion

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- Validation rates comparable to those of countries where mesothelioma register exists :
  - 33 - 68% confirmed
  - 6 - 24% possible/undetermined
- Proportion of compensated cases *vs*. tumour registry data: comparable to those reported for Ontario [Barroetavena *et al.*, 1996 : 25 %; Waller et Marrett, 2006: 38%; Payne et Pichora, 2009: 43%], British Columbia [Teschke et Barroetavena, 1992 : 37 %] or Alberta [Cree *et al.*, 2009 : 41,7 %]
- Strengths: Experienced specialists, revised all new tumour registry cases in Québec in 2001-2002
- Weaknesses: Access to partial charts & estimated only false positives

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Final words…

- Tumour Registry data are useful for pleural mesothelioma surveillance – Complement compensation data
- Should we « correct » for a proportion of QTR cases that are unlikely or not pleural mesotheliomas?
  - No… Illusion of exhaustiveness because very likely that some « real » cases are not coded properly in QTR
- Still have to emphasize the importance of taking a good occupational history (medical students, residents & MDs)
- Careful design of validation studies necessary to ensure that results are not hampered by quality of the available material
- Workers have a right to compensation and it is worth encouraging them or their family to submit a claim

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