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Individuels ou populationnels : les défis de la communication des résultats de biosurveillance



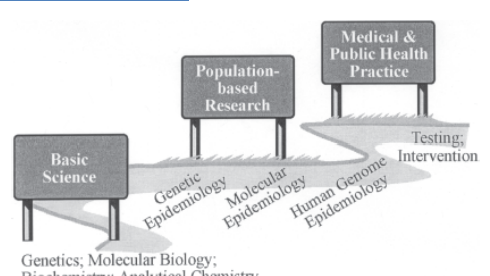
BC Centre for Disease Control
An Agency of the Provincial Health Services Authority

JASP 2013

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BC Centre for Disease Control

Continuum from basic science to medical and public health practice

Individuels ou populationnels ?



Basic Science
Genetics; Molecular Biology; Biochemistry; Analytical Chemistry

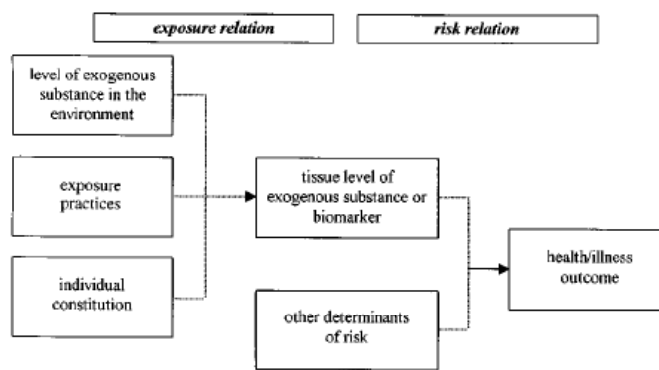
Population-based Research
Genetic Epidemiology
Molecular Epidemiology
Human Genome

Medical & Public Health Practice
Testing; Intervention

Défi 1 : contexte de la biosurveillance

Schulte, 2004

Exposure relation and risk relation



Deck, 1997

TABLE 1—Answers to Typical Participant Questions About Their Personal Exposure Results

Question	Information
Description	
What did you find?	List of detected chemicals
How much?	Concentration shown in a table or graph
Analysis/Comparison	
Is that high?	Study participant's result shown in relation to the distribution of others in the study or a reference group such as the CDC Exposure Report
Is it safe?	Study participant's result shown in relation to a health-based regulatory guideline and concentrations associated with health effects in epidemiological studies
What should I focus on?	Results for multiple chemicals shown in relationship to each other
Where did the chemical come from?	List of types of products or processes that commonly contain or emit detected chemicals, such as combustion and auto exhaust
Recommendation	
What can/should I do?	Individual and community exposure-reduction strategies, precautionary strategies, research needs

Participants d'un projet de recherche : que veulent-ils ?

Défi 4 : Désirs et besoins des participants

Brody, 2007

Note. CDC = Centers for Disease Control and Prevention.

'What do you think is the best **process** to receive laboratory results?'

Participants d'un projet de recherche : comment veulent-ils ?

	In person* (n = 53)	Not in person† (n = 289)	p Value
Mother's age (yrs)(SD)	27.7 (6.5)	30.3 (5.5)	0.002
Mother's race n (%)			
White	24 (10.3)	207 (89.7)	<0.0001
African American	27 (30.3)	62 (69.7)	
Other	2 (9.1)	20 (90.9)	
Mother's education n (%)			
No college	23 (34.3)	44 (65.7)	<0.0001
Some college	15 (17.4)	71 (82.6)	
College grad	15 (7.9)	174 (92.1)	
Marital status n (%)			
Married, together	21 (8.8)	216 (91.2)	<0.0001
Other	32 (30.5)	73 (69.5)	
Mean household income \$(SD)	41000 (29600)	65500 (60600)	0.0003
WASI-full scale IQ (SD)	97 (17.1)	109 (13.0)	<0.0001

One response was missing.

*In person, in person with the researcher or physician.

†Not in person, letter, letter with phone number, email/internet, and other.

WASI, Wescheler Abbreviated Scale of Intelligence.

Wilson, 2010

'What do you think is the best **format** to receive laboratory results?'

Participants d'un projet de recherche : dans quel format préfèrent-ils ?

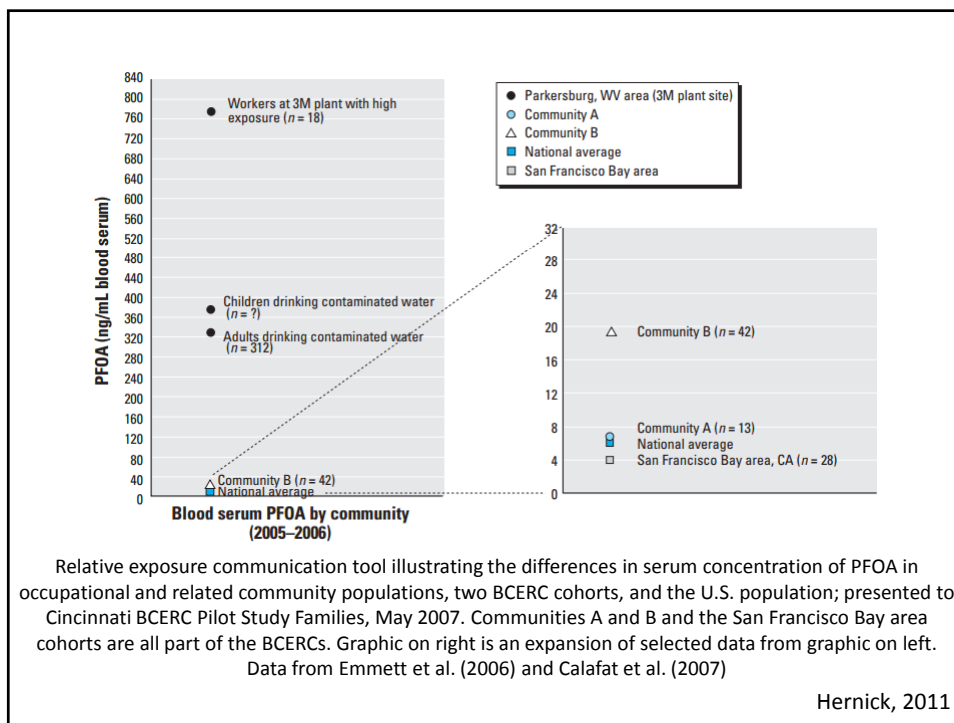
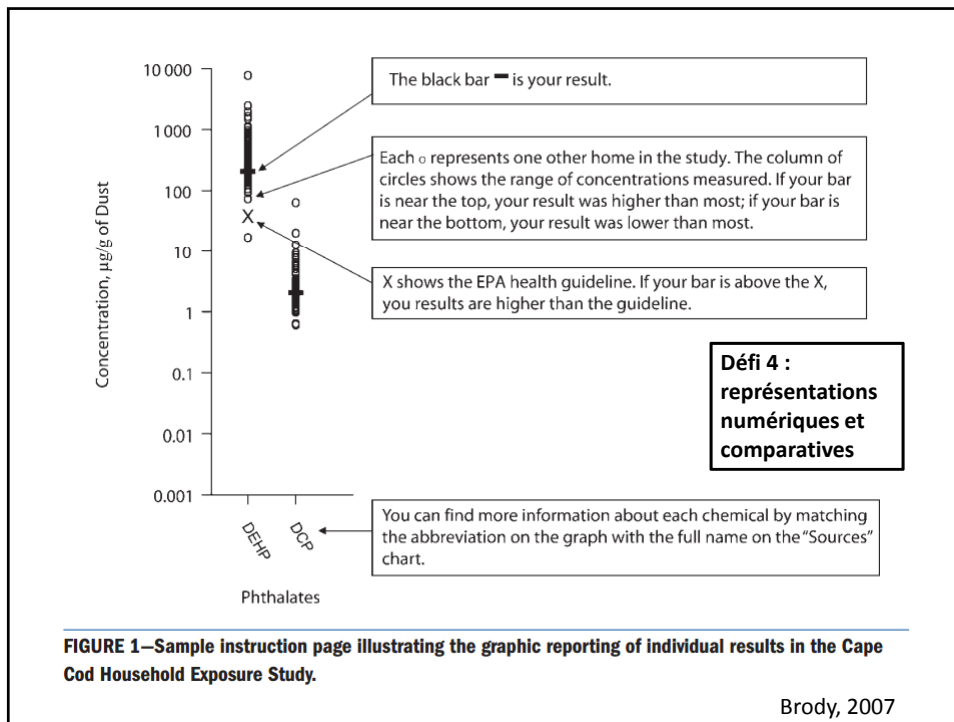
	More complex* (n = 272)	Less complex† (n = 71)	p Value
Mother's age (yrs)(SD)	30.4 (5.6)	28.0 (5.6)	0.002
Mother's race n (%)			
White	193 (83.6)	39 (16.8)	0.002
African American	59 (66.3)	30 (33.7)	
Other	91 (90.9)	9.1 (9.09)	
Mother's education n (%)			
No college	40 (59.7)	27 (40.3)	<0.0001
Some college	68 (79.0)	18 (20.9)	
College grad	164 (86.3)	26 (13.7)	
Marital status n (%)			
Married, together	200 (84.0)	38 (16.0)	0.001
Other	72 (68.6)	33 (31.4)	
Household income \$(SD)	66400 (42400)	43800 (40600)	0.0002
WASI-full scale IQ (SD)	109 (13.4)	101 (15.9)	0.0001

*More complex, percentile and actual value + range.

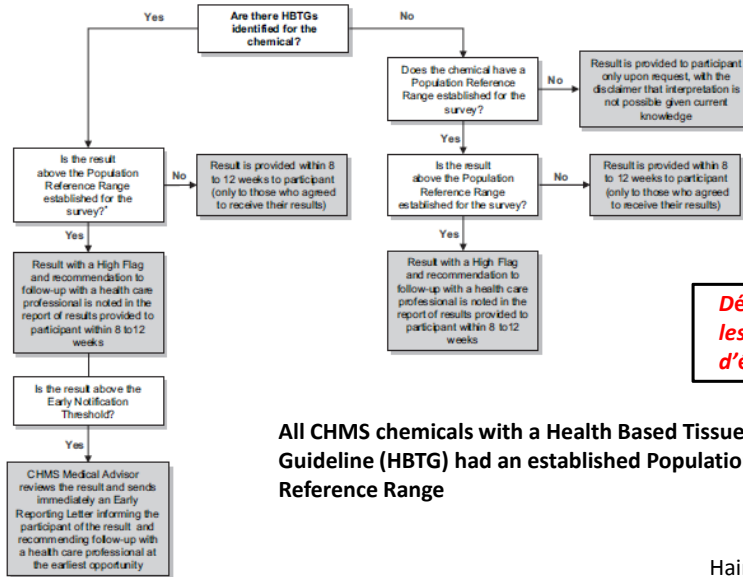
†Less complex, burden, range, and actual value.

WASI, Wescheler Abbreviated Scale of Intelligence.

Wilson, 2010



Canadian Health Measures Survey (CHMS) approach to reporting biomonitoring results to participants

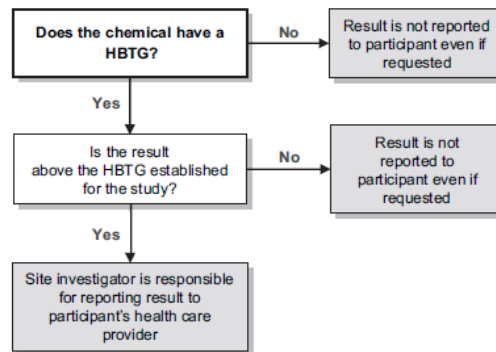


**Défi 5 :
les comités
d'éthique**

All CHMS chemicals with a Health Based Tissue Guideline (HBTG) had an established Population Reference Range

Haines, 2011

Maternal-Infant Research on Environmental Chemicals (MIREC) Study approach to reporting biomonitoring results to participants



HBTG, health-based tissue guidelines

Haines, 2011

Guide to interpreting lead and mercury levels

Brodkin, 2007

Measurement	95th percentile of adult population*	Threshold level for action	
		Investigate possible exposure†	Refer for advice about clinical management‡
Blood lead	0.22 µmol/L (4.6 µg/dL)	0.48 µmol/L (10.0 µg/dL)	1.90 µmol/L (40.0 µg/dL)
Blood mercury	23 nmol/L (4.6 µg/L)	50 nmol/L (10.0 µg/L)	200 nmol/L (40.0 µg/L)
Urine mercury	4.0 nmol Hg per mmol creatinine	19.8 nmol Hg per mmol creatinine‡	—¶

*These levels are derived from the US National Health and Nutrition Survey and represent levels below which 95% of the adult population is expected to fall. Values below these levels can be considered normal.
 †Exposure is significantly beyond that experienced by the general population and should prompt a search for the source of exposure with a view to reducing it.
 ‡Follow-up is not recommended on the basis of the urine level alone; obtain blood mercury level as well.
 §Values warrant a consultation with a clinical toxicologist for advice about management options.
 ¶Insufficient data.

Défi 6 : de la population à l'individu, de la recherche à la clinique

Communicating with groups, communicating with individuals

Groups

- Context
- Harm to group
- Risk benefit

Individuals

- Context
- Individual harm
- Risk benefit



Nature of communication

- Participative
- Authoritative

Frequency of chromosome aberrations in Czech children with indoor exposure to formaldehyde in different periods of time

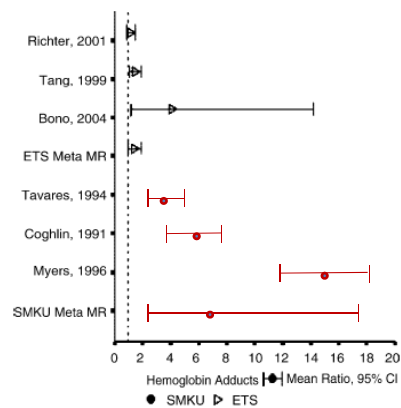
Exposure group	Period	Formaldehyde ($\mu\text{g}/\text{m}^3$)	Subjects	No. of metaphases	% Aberrant cells (mean \pm S.E.)
School children					
Exposed	1984	317	20	1720	4.71 \pm 2.09*
	1985	130	16	1340	2.83 \pm 1.64*
	1986	36.5	18	1600	2.06 \pm 1.61
Referents	1984	–	17	1473	1.37 \pm 0.89
	1985	–	17	1653	2.24 \pm 1.11
Pre-school children					
Exposed	1984	210–360	13	1300	2.40 \pm 1.46
Referents	1984	–	24	2400	1.12 \pm 1.05

* $P < 0.01$ (exposed 1984 and 1985 vs. referents 1984), modified from Dobias et al. [71].

Défi 7 :
comment aborder
le nouveau

Neri, 2005

Hemoglobin adducts in newborns versus children exposed to environmental tobacco smoke



Gérer les
résultats
inattendus ?

Hemoglobin adducts meta-mean ratio (SMKU meta-MR) computed in newborns exposed to cigarette smoke in utero and in children exposed to environmental tobacco smoke (ETS meta-MR).

Neri, 2006

Individuels ou populationnels : les défis de la communication des résultats de biosurveillance

Défi 1 : spécifier le contexte de la biosurveillance

Défi 2 : la microdétection des xéno-biotiques

Défi 3 : continuum entre exposition et effets -- Un biomarqueur spécifique—qu'est-ce qu'il représente ??

Défi 4 : représentations numériques et comparatives

Défi 5 : les comités d'éthique

Défi 6 : de la population à l'individu, de la recherche à la clinique

Défi 7 : aborder le nouveau

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