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Sent: Thursday, March 31, 2005 2:26 PM (GMT)
To: benzconsort-tc@listserve.api.org
Subject: BHRC-TC... New Documents for Review
Attach: Irons_BIMDS_Mar2005.pdf; Thoughts on Bn EA.doc

Benzene Health Research Consortium (BHRC) Technical Committee (TC) -

1) Courtesy of Michael Bird, attached is a copy (19-page pdf) of a recent draft manuscript from Richard Irons: **Benzene-Induced Myelodysplasia: New Insights from an Old Nemesis** by R.D. Irons, L. Lv, X. Ye, L. Bao, X.Q. Wang, J. Ryder, T.W. Armstrong, Y. Zhou, L. Miao, S.A. Gross and H. Fu.

2) Draft **Thoughts on Benzene Exposure Assessment** (3-page doc) from Gary Krieger's visit to Fudan University, 27 March 2005.

Best Regards - Bruce.

I. Some thoughts on EA updating

1. Coding system:
 - Consistent job title identified
 - Each 3-digit occupational and industry code
 - Combined use of 1982 consensus and the updated Industry Classification Code (by Hu Shida, et al, SHA CDCP?)
 - Check the coding system used by Shanghai Cancer Institute, Gao Yutang, et al, [Reference?](#))
2. Exposure status
3. Ranged exposure intensity: 0-1ppm; 1-10 ppm; 10-50 ppm; >50 ppm or mg/m³ by multiplying with 3.2 based on IPHS database
 - Frequency: times-hr/day x 5 (days) x 50 (wks)
 - Duration: focused between historical period either 1980-2005 or 1985-2005
4. Route of exposure
 - Inhalation
 - Dermal contact
5. Task: job titles and activities in details: Clearly define industry, occupation, job title and task; for example, a truck driver could probably be categorized as:
 - Industry: transportation
 - Occupation: driver
 - Job title: lead driver or assistant driver
 - Tasks: mechanical maintenance, fueling, driving, etc
6. Information sources required
 - IPHS database
 - Literature published including: 1) case reports characterized by higher exposure: peak, maximum; 2) industrial hygiene surveys available in relatively systematic data of sampling, by passive badge, tube, or pumped in low/medium flow rate in l/min; monitored in area and/or personal samplings; expressed as MAC, TWA, mathematic mean, etc
7. Supplemental information
 - Further subject investigation: to decide who should be further tracked-back/followed-up, need a collated file for the existing subjects identified as Bn exposure and potential Bn exposure, approximately 100-130 at the moment
 - Further factory investigation: to support surrogate factories selecting it requires: 1) analysis of existing data from Qs obtained; 2) updated criteria for the selection, in terms of scale of factory, ownership, products, age of factory, working conditions, job title/task of workers, materials content % Bn, etc; and 3) further evidence from IPHS database
8. Possibility of access
9. Consideration of workers' mobility during different historical period
10. Decision tree
11. Initiate a pilot study for 10-20 subjects concerned

II. Work history

1. Can we assign range for each segment of the work history?
 - Example: 0-1ppm; 1-10 ppm; 10-50 ppm; >50 ppm
2. Work period and title
 - A. Shoes factory 1985-87
 - B. Shoes factory 1992-94
 - C. Painting-indoor 1995-2000
 - For work A: shoes Factory No. 3, 1985-87, may include:
 - a) To **ask worker**: about tasks-define specific tasks on what, when, how often, how long, how big, etc, that are unlikely to actually have access to factory records
 - b) To **check IPHS database**: Is there IPHS data at the correct time, geographically similar (Time mismatch, similar areas in Shanghai?)
 - c) To update **surrogate criteria**: 1) What is a “surrogate factory”; 2) Similarities in scale, size of working population, ownership of factory, products, age of factory, working conditions, job title/task, materials content % Bn, etc;
3. Do we need a pilot study now for some (say, 10) of the 98 definitive Bn exposure cases, and 10 uncertain cases to make sure:
 - Where are we?
 - Can we meet existing Protocol?
 - What revisions are necessary; what to simplify/accelerate?
 - Do we have adequate staff?
 - How long will it take to work-up the cases?
 - What are the difficulties?
 - What are the barriers?
4. Factors affecting job mobility:
 - Chronology (example)

Date of birth (DOB)	Age in 1980	Age at Diagnosis
1930	50	75
1940	40	65
1950	30	55
1960	20	45
1970	10	35
1980	0	25

- “Supposed Scenario”:

Development domain	Time period	Socioeconomic characteristics
Agriculture-industry	Pre-1965	Great leap to pre-cultural revolution
Agriculture-industry	1966-1976	Cultural revolution
Rapid industrialization	1978-1990	Deng’s economy reform and openness policy
Industry-service-agriculture	1990-2005	Rapid development in Shanghai
	● 1980-1985	Employment stability
	● 1985-1990	Economy restructuring
	● 1990-2000	Rapid migration/transition

Service-industry-agriculture	● 2000-2005	Accelerated transition to services
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So, what is the likely employment history, for people who were born in 1930?

Year	Age	Supposed employment status
1950-1960	20	Agriculture, state-owned enterprises, professional/service or student
1960-1970	30-40	Agriculture, state-owned enterprises (cultural revolution)
1970-1975	40-45	Cultural revolution, agriculture, state-owned enterprises
1980-1985	50-55	Start of economy reform
1990-1995	60-65	Rapid transition; urbanization, job movement (job-insecurity)
1995-2000	65-70	Retirement, rapid transition, labor movement/migration
2000-2005	70-75	Fully retired, accelerated transition, labor movement/migration

III. IPHS database

1. Does the factory reported by the worker exist in the IPHS database? Yes or No
 - If yes, what are the dates?
 - Do these dates match the workers history? Yes or No
 - If no, what is the mismatch?
 - Early dates on late data ?
 - What level of “mismatch” is acceptable? Pre 1990-92 versus 1992?
2. Same questions for literature database
3. How do we use surrogates?
 - Can we use a surrogate pre-1990-92 for a post-1992 factory?
4. What are the “mismatching” requirements
 - Size of factory
 - Date of factory construction: Pre-1990-92
 - How do we know processes and job asks are similar?
5. What is the appropriate expression of the exposure?
 - Is it appropriate to time-weight a 1-hour high exposure intensity to a 8-hour TWA?
6. For example, IPHS: 10 ppm (32 mg/m³)-1 hr extrapolate to a cumulative exposure level of TWA ppm-yr.

(Summarized, 26-27 March, 2005, Shanghai)