

# Progress on the Human Milk Survey

## Thailand

Pollution Control Department, MONRE  
Faculty of Public Health, Thammasat University



กรมควบคุมมลพิษ  
POLLUTION CONTROL DEPARTMENT



# Presentation Outlines

- Co-ordination Mechanism
- National progress on human milk survey
- Next Plan



# Co-ordination Mechanism

National Subcommittee on Stockholm Convention under NEB



Approved Air Sampling Site at “Wachiralongkorn Dam” located in the western region in Apr 2016



Approved FPH, TU to carry out GMP2 Asia in Aug 2017



Established the Working Group on POPs Monitoring in Feb 2018



Approved what kinds of national matrix samples in July 2018

# National Progress on Human Milk Survey

Oct and Dec 2017	<ul style="list-style-type: none"><li>• Twice meetings with the collaborative organizations</li></ul>	Apr – May 2018	Preparing the sampling bottle, documents in Thai and accessories.
Dec 2018	Preparing related documents in Thai for ethical clearance	Jun 2018	Organizing teleconference with 12 Health Centers
Jan 2018 Mar 2018	Submitting for ethical clearance Getting ethical approved	Jun 2018	<ul style="list-style-type: none"><li>• Delivering the sampling bottle to Health Centers</li></ul>
Mar and May 2018	<ul style="list-style-type: none"><li>• Twice meetings between DOH and FPH, TU</li></ul>	Jul – Aug 2018	<ul style="list-style-type: none"><li>• Collecting human milk from donors and delivering to FPH, TU</li></ul>



# Meeting with the collaborative organizations

- To find the collaborative organizations for “Human Milk Sampling and POPs Analysis Activities”
- The corporative organizations for taking human milk samples are:
  - **Bureau of Health Promotion, Department of Health, MOPH**
  - **Pollution Control Department, MNRE**
  - **Faculty of Public Health, TU**
- The corporative organizations participated in analyzing the samples are:
  - **Bureau of Environmental and Occupational Disease, Department of Disease Control, MOPH**
  - **Department of Medical Sciences, MOPH (Dioxins and dl PCBs)**
  - **Department of Livestock Development (organochlorines/ To be confirmed)**

# Preparing Phase

- Glassware received from CVUA
- Ethical clearance for human milk sampling obtained from Thammasat University
- Meeting between Bureau of Health Promotion, Department of Health and Faculty of Public Health in March and May 2018
  - To clarify the objectives, procedure and schedule of the project activity
  - To set up the work plan and process
- Teleconference with 12 Health Centers

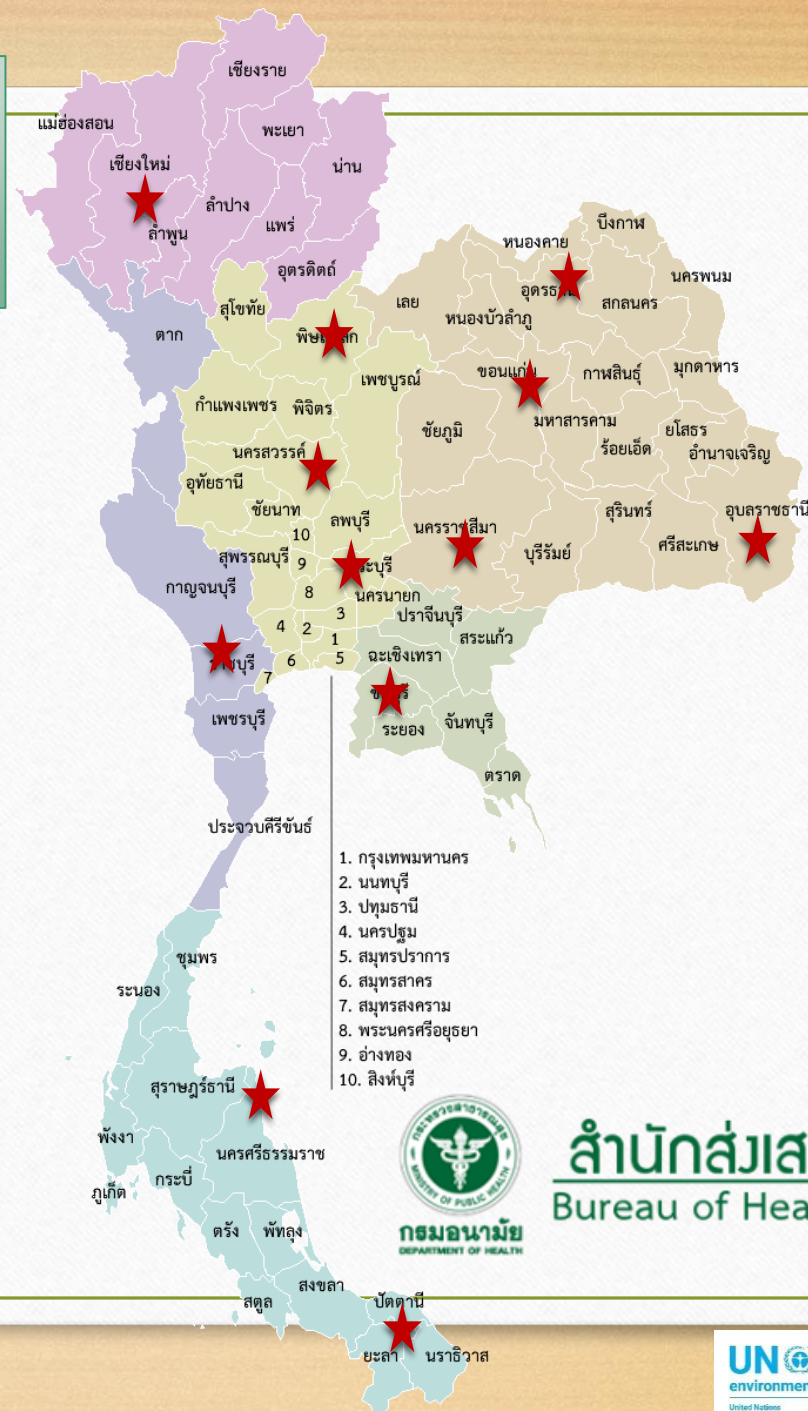


สำนักส่งเสริมสุขภาพ  
Bureau of Health Promotion



# 12 Health Centers participating in human milk sampling

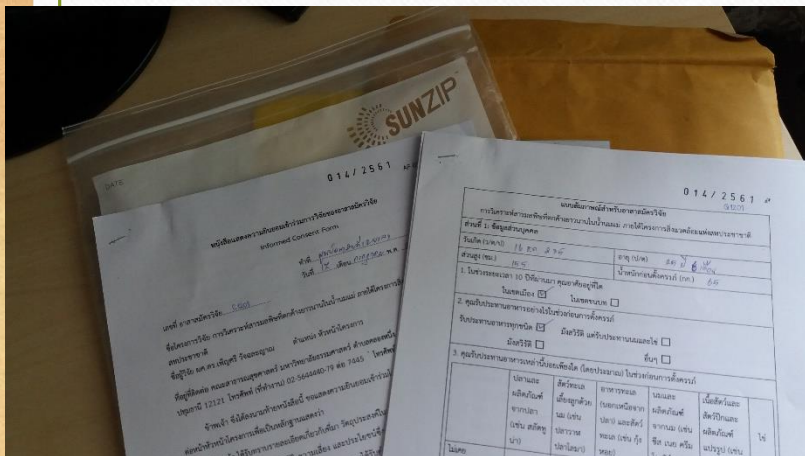
1. Chiang Mai
2. Phitsanulok
3. Nakhon Sawan
4. Saraburi
5. Ratchaburi
6. Chonburi
7. Khon Kaen
8. Udon Thani
9. Nakhon Ratchasima
10. Ubon Ratchathani
11. Nakhon Si Thammarat
12. Yala



**สำนักส่งเสริมสุขภาพ**  
Bureau of Health Promotion



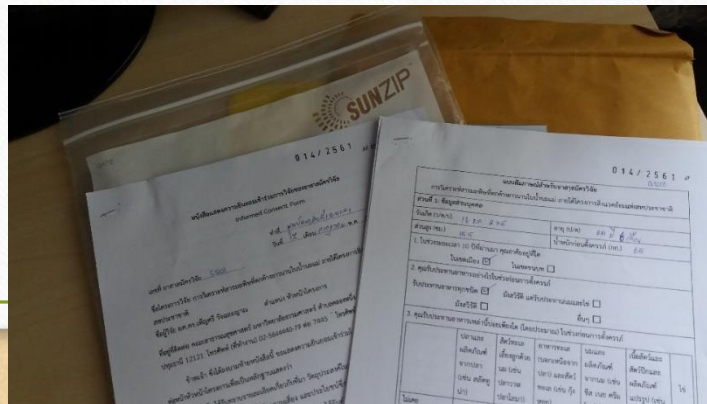
# The sampling kits preparation for each Health Center





# Translation all documents in Thai

1. Procedures for Health Center:  
Documentation / Sampling Procedure /  
Collecting / Transportation
2. Selection Criterion
3. Participant information sheet
4. Consent form
5. Questionnaires
6. Sampling Instruction for Donors
7. Summary of Project





# Procedures for Health Center

1

แบบสัมภาษณ์สำหรับอาสาสมัครวิจัย						
การวิเคราะห์สารมลพิษที่ตกค้างยาวนานในน้ำนมแม่ ภายใต้โครงการสิ่งแวดล้อมแห่งสหประชาชาติ						
ส่วนที่ 1: ข้อมูลส่วนบุคคล						
วันเกิด (ว/ด/ป)			อายุ (ป/ด)			
ส่วนสูง (ซม.)			น้ำหนักก่อนตั้งครรภ์ (กก.)			
1. ในช่วงระยะเวลา 10 ปีที่ผ่านมา คุณอาศัยอยู่ที่ใด						
ในเขตเมือง <input type="checkbox"/>			ในเขตชนบท <input type="checkbox"/>			
2. คุณรับประทานอาหารอย่างไรในช่วงก่อนการตั้งครรภ์						
รับประทานอาหารทุกชนิด <input type="checkbox"/>			มังสวิรัต แต่รับประทานนมและไข่ <input type="checkbox"/>			
มังสวิรัต <input type="checkbox"/>			อื่นๆ <input type="checkbox"/>			
3. คุณรับประทานอาหารเหล่านี้บ่อยเพียงใด (โดยประมาณ) ในช่วงก่อนการตั้งครรภ์						
	ปลาและ ผลิตภัณฑ์ จากปลา (เช่น สลัดทู น่า)	สัตว์ทะเล เลี้ยงลูกด้วย นม (เช่น ปลาวาฬ ปลาโลมา)	อาหารทะเล (นอกเหนือจาก ปลา) และสัตว์ ทะเล (เช่น กุ้ง หอย)	นมและ ผลิตภัณฑ์ จากนม (เช่น ชีส เนย ครีม โยเกิร์ต)	เนื้อสัตว์และ สัตว์ปีกและ ผลิตภัณฑ์ แปรรูป (เช่น ไส้กรอก)	ไข่
ไม่เคย						
น้อยกว่าสัปดาห์ ละ 1 ครั้ง						
สัปดาห์ละ 1 ครั้ง						
สัปดาห์ละ 2 ครั้ง						



If each donor decides to participate in the project, she have to sign the consent form and then the health center officer will interview her by using the prepared questionnaires.



## Sampling procedures:

## Procedures for Health Center

1

1. Provide each donor the human milk sampling bottle and make sure that the code labelling on each bottle as same with codes on each questionnaire and each consent document
2. Explain a donor the sampling methods according to the “Sampling Instruction for Donors”
3. In case that a donor will collect the milk sample at her home, ensure that she has the name and contact number of the officer in her sampling instruction document for a donor and inform a donor on how to deliver the sample bottle back to the health center on the appointed date.





## Sampling Instruction for Donors

6

- Collecting human milk samples at the health center or at home
- Cleansing a donor' breasts and hands with clean water (Do not use the soap)
- Pumping the milk by hand directly into the provided sample bottle.



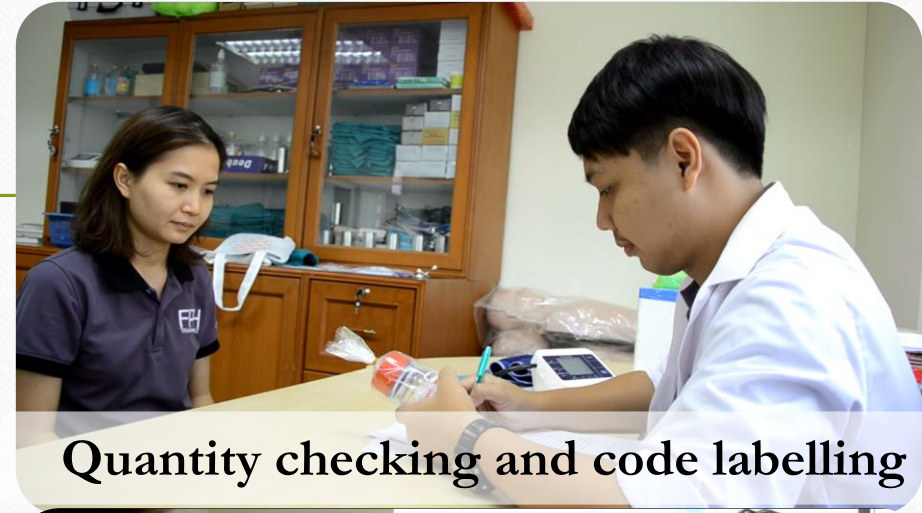


# Procedures for Health Center

1



Sample collecting



Quantity checking and code labelling



Parafilm wrapping up



Putting in plastic bag and  
tighten sealing



## Procedures for sending the sample bottle and documents:

1. Freezing the ice packs in the refrigerator until they are frozen in advance.
2. When getting all frozen milk samples, putting an ice pack at the bottom and every side of the foam box. After that, putting the frozen milk sample bottle in the box and putting a plastic plate in between to prevent bottles bumping. Ices may be added between bottles to keep the cool temperature. Then, adding an ice pack on the top before closing the box.







### **Project Coordinator:**

1. Ms. Chanida Somsuk Bureau of Health Promotion, DOH

Tel. 081 394 4441

2. Assistant Dr. Pensri Wacharayann, Faculty of Public Health, TU

Tel. 085 075 9997

3. Sealing the filled foam box with plastic tape.

4. Labelling Faculty of Public Health, TU as a receiver on the foam box.

5. Putting the completed questionnaire and consent document in the envelopes and labelling Faculty of Public Health, TU as a receiver.

6. Then, putting the foam box and the filled envelop in the double plastic bags and labelling Faculty of Public Health, TU as a receiver.

7. In case of using public bus for delivery, please inform Assistant Dr. Pensri Wacharayann 1 day in advance by phone for designating the responsible person to pick up the samples.

8. In case of by-hand delivering, please directly contact Assistant Dr. Pensri Wacharayann, Faculty of Public Health, TU

# Selection criterion in chapter 4.3.1

- Mother should be *primiparae*.
- Mother should be under 30 years of age (an age range might be considered a useful criterion)
- Both mother and child should be apparently healthy, including normal pregnancy.
- Mother should be breastfeeding one child only (*i.e.*, no twins).
- Mother should have resided in the represented area (country) for at least the previous ten years.
- Mother should not reside in local areas where emissions of POPs are known or suspected to result in elevated concentrations of POPs in the local population.
- Mother should be available for sample collection within 3 to 8 weeks of delivery
- Special consideration should be given to the exclusion criteria



# Human Milk Sampling

- Milk from donor mothers is collected at least 50 ml of milk by hand expression after a feeding or while infant is nursing on the other breast.
- The sample should be collected directly to the collecting jar and, if collected at home, stored in the collecting jar in the home freezer until it can be delivered. Otherwise milk samples may be stored in the refrigerator at about 4 °C for a maximum of 72 hours, or for longer times in the freezer at -20°C.

## ANNEX 2 QUESTIONNAIRE FOR POTENTIAL HUMAN MILK DONORS

### Questionnaire for Potential Human Milk Donors

UNEP-coordinated Survey of Human Milk for Persistent Organic Pollutants

**CONFIDENTIAL!**

#### Section 1: Personal Information

Name	Phone number	Today's Date (dd/mm/yyyy)
	e-mail	
Address		

#### Section for National Coordinator

Individual Identification Code	Pool Identification Code	
Based on established criteria, is the participant eligible?		
Yes <input type="checkbox"/>	No <input type="checkbox"/>	
What is the status of donor in regard to the survey?		
Selected <input type="checkbox"/>	Reserve <input type="checkbox"/>	Not Selected <input type="checkbox"/>
<p>If this mother has been pre-selected to donate a sample (or is designated as an alternate), the top of Section 4 should be completed and detached from this questionnaire. Section 4 should be sent to the clinic to be completed at the time of sample collection.</p>		

#### Section 2: Screening Questionnaire

Name of Interviewer:	Date of interview (dd/mm/yyyy):
Place of interview:	
1. Are you planning to breastfeed your child?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
2. Is this your first child?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
3. Are you expecting a single child? (not twins)	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
4. Are you having a normal healthy pregnancy?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>
5. Have you lived in your current area for 10 years?	
Yes <input type="checkbox"/>	No <input type="checkbox"/> *
If no, actual number of years _____	
6. Are you under 30 years of age?	
Yes <input type="checkbox"/>	No <input type="checkbox"/> *
If no, date of birth _____ (dd/mm/yyyy)	
7. Do you live near incinerators, pulp and paper industries, metal industries or where chemicals are produced	
Yes <input type="checkbox"/>	No <input type="checkbox"/>

\*Note that if the answers to questions 5 or 6 was "no", please ask what the participant's actual residence time and/or birth date.

Instruction to interviewer: If any answers to questions 1-6 were "no" or if the answer to question 7 was "yes", the participant is not eligible for this survey. Please thank the participant for their interest in the survey and end this interview. If all answers are "yes" except question 7, proceed with Section 3.



**Section 3: Health History Questionnaire**

Date of Birth (dd/mm/yyyy)		Age				
Height (cm)		Weight before pregnancy (kg)				
1. What is your expected delivery date (dd/mm/yyyy)?						
2. Where have you been residing during last 10 years:						
urban (city) <input type="checkbox"/>		rural (countryside) <input type="checkbox"/>				
3. How would you describe your dietary habits before pregnancy?						
Mixed diet <input type="checkbox"/>		Vegetarian but with milk and eggs <input type="checkbox"/>				
Strictly vegetarian <input type="checkbox"/>		Other <input type="checkbox"/>				
4. How often, on average, did you eat following foods before pregnancy?						
	Fish and fish products (e.g. tuna salad)	Marine mammals (e.g. whales, dolphins)	Seafood other than fish and marine mammals (e.g. shrimps, mussels)	Milk and milk products (e.g. cheese, butter, cream, yogurt)	Meat and poultry and derived products (e.g. sausage)	Eggs
Never						
Less than once a week						
Once a week						
Twice a week						
More than twice a week but not every day						
Every day						

4.1 What types of fish do you consume most often?

Fish from the sea       Freshwater fish       Both

Please state the species if known :

5. Was your mother born in this country?      Yes       No

6. Were you breastfed?      Yes       No       Do not know

If you know, for how long? \_\_\_\_\_

7. Were you engaged in work other than housework before pregnancy?      Yes       No

If yes, please state the duration and describe type of work :

8. Has the inside of your house been sprayed with DDT in order to prevent mosquitoes?      Yes       No       Do not know

If yes, when? \_\_\_\_\_

**Instructions to interviewer:**

If this is a prenatal interview, the questionnaire with Sections 1-3 completed should be sent to the National Coordinator at this point for review.

If this is a postnatal interview and the sample will be collected today, proceed to Section 4.



#### Section 4. To be completed by the Sample Collector

Name of Collector:	Date of sampling (dd/mm/yyyy):
Clinic of Collection:	Place of collection:

#### Postnatal Information (to be taken at the time of sampling)

1. Are you prepared to sign the consent form? Yes  No   
If yes, attach signed consent form. If no, mother is not eligible to participate in survey.

2. How old is your infant?  
less than 3 weeks\*  3-4 weeks  5-8 weeks  more than 8 weeks\*\*

3. What is the sex of your infant?  
Male  Female

4. Is your current weight different than your weight before pregnancy?  
Gained  Lost  Not changed

5. Can you provide a sample now?  
Yes  Later  When? \_\_\_\_\_ At home   
If you want to take the sample at home, do you have a refrigerator? Yes  No  \*\*\*

\* Infant has to be more than 3 weeks (21 days) old. The collector should advise the mother to return after the infant is 3 weeks old for milk sampling.

\*\* Sample must be collected within 3 to 8 weeks after delivery. Do not take the sample. Inform National Coordinator of the situation.

\*\*\* A tablet of potassium dichromate needs to be added to the collection jar and the mother caution about its potential toxicity.



# The Human milk samples from each Health Center delivering to Faculty of Public Health, Thammasat University



# Next Plan: Human milk analysis

- Now we got 55 samples of 60 samples (total). We expect that the sampling will be completed by this week. Then we will do the pooled sample.
- Equal aliquots of these individual samples are mixed to form a composite sample (“pooled sample”) and send to CVUA for POPs analysis
- The pooled sample may be sent to Dr. Rainer Malisch Chemisches und Veterinäruntersuchungsamt (CVUA) Freiburg (State Institute for Chemical and Veterinary Analysis of Food) Bissierstr. 5 D-79114 Freiburg Germany.
- Contacting to TNT Thailand for transportation.
- With or Without Dry Ice



To prepare pooled samples, the 50 individual milk samples are homogenized by shaking for 5 minutes. The 50 ml individual samples have to be split in two portions of 25 ml each (see Figure 4).

Sample preparation scheme: Preparation of individual samples for analysis of basic POPs by country and of pooled (mixed) samples  
(Before taking an aliquot, shake intensely at room temperature and then take the aliquot immediately.  
Storage and shipment of all samples deep-frozen.)



50 ml



take 25 ml into 2000 ml bottle (50 \* 25 ml ea = 1250 ml)



Send the 2000 ml bottle with frozen pooled samples to WHO/UNEP Reference Lab



25 ml



Individual samples for analysis by country for basic POPs

For (deep-frozen) storage in and analysis by country. If no analysis in country possible and no storage capacity available, contact UNEP.

Figure 4: Sample preparation scheme

# Next Plan: Human milk analysis

- The analysis of the individual samples (from the individual donors) can provide information on the distribution of exposures and on factors possibly contributing to exposure.
- Since 2007 the WHO/UNEP guidelines recommend the analysis of individual samples for the basic pesticide POPs and indicator PCB in the participating country.
- These compounds can be determined by analytical methods requiring basic instrumentation available in many developing countries, such as HRGC with ECD.
- For quality control purposes, the mean results of individual analyses can be compared with the result of the pooled sample analyzed by the WHO/UNEP Reference Laboratories because the average value from individual samples should be equal to the pooled sample value.
- Extend the ethic approval.



Organization	Type of Sample	Analysis of POPs
PCD	Sampling Both Abiotic & Fish	-
National Institute of Dioxin	Abiotic	Dioxin/PCBs
MTEC	Abiotic (not for PUFs)	PBDE/ HBCD
Department of Agriculture	Abiotic (not for PUFs)	OCP
Department of Medical Science	Biotic	OCPs / PCBs / dl-POPs
Bureau of Env & Occ Disease Control, DDC	Biotic (Human Tissue: Blood/Urine/Human Milk?)	In developing
Department of Livestock Development	Biotic (TBC)	OCPs / PCBs / Dioxin
MU	Abiotic	PFOS

спасибо  
danke 謝謝  
ngiyabonga  
teşekkür ederim  
dank je  
tapadh leat  
gracias  
mochchakkeram  
go raibh maith agat  
dziękuje  
hvala  
mauruuru  
sagolun  
sukriya  
kop khun krap  
arigatō  
tak  
dakujem  
merci  
merci  
terima kasih  
ευχαριστώ  
obrigado  
bedankt  
obrigado