

Center for MOther and Children's Health and Environment(MOCHE) in Korea

Research approval committee

IRB board

Advisory board

Coordinating center

- Monitoring
- Making protocol
- Developing educational materials

Bio-repository Center
NEODIN*

Nutrition center

*: outsourcing

Frontier center
in SEOUL

- OB&GY
- preventive medicine
- Pediatrics

Local hospital

PHCC

Frontier center
in CHEONAN

- OB&GY
- preventive medicine
- Pediatrics

Local hospital

PHCC

Frontier center
in ULSAN

- OB&GY
- Industry medicine
- Pediatrics

Local hospital

PHCC

Environmental Assessment Center

Neurobehavior center

PHCC : primary health care center in community

Supported by the Ministry of Environment, Republic of Korea

The center of indoor and outdoor environmental assessment investigates

- air quality for indoor environment of each participant's home.
- distribution of characteristics for indoor and outdoor air pollutants such as PM10, PM2.5, VOCs, HCHO, NO2, and dust mites
- personal exposure of each participant for VOCs, HCHO, and NO2.

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Major roles of neurocognitive developmental center are as follows:

- 1. Fine developmental assessment of infant and toddler by Bayley Scales of Infant Development**
- 2. Assessment of infant development by age and stage questionnaire**
- 3. Investigating the relationship between mental, emotional, language development and environmental variables**

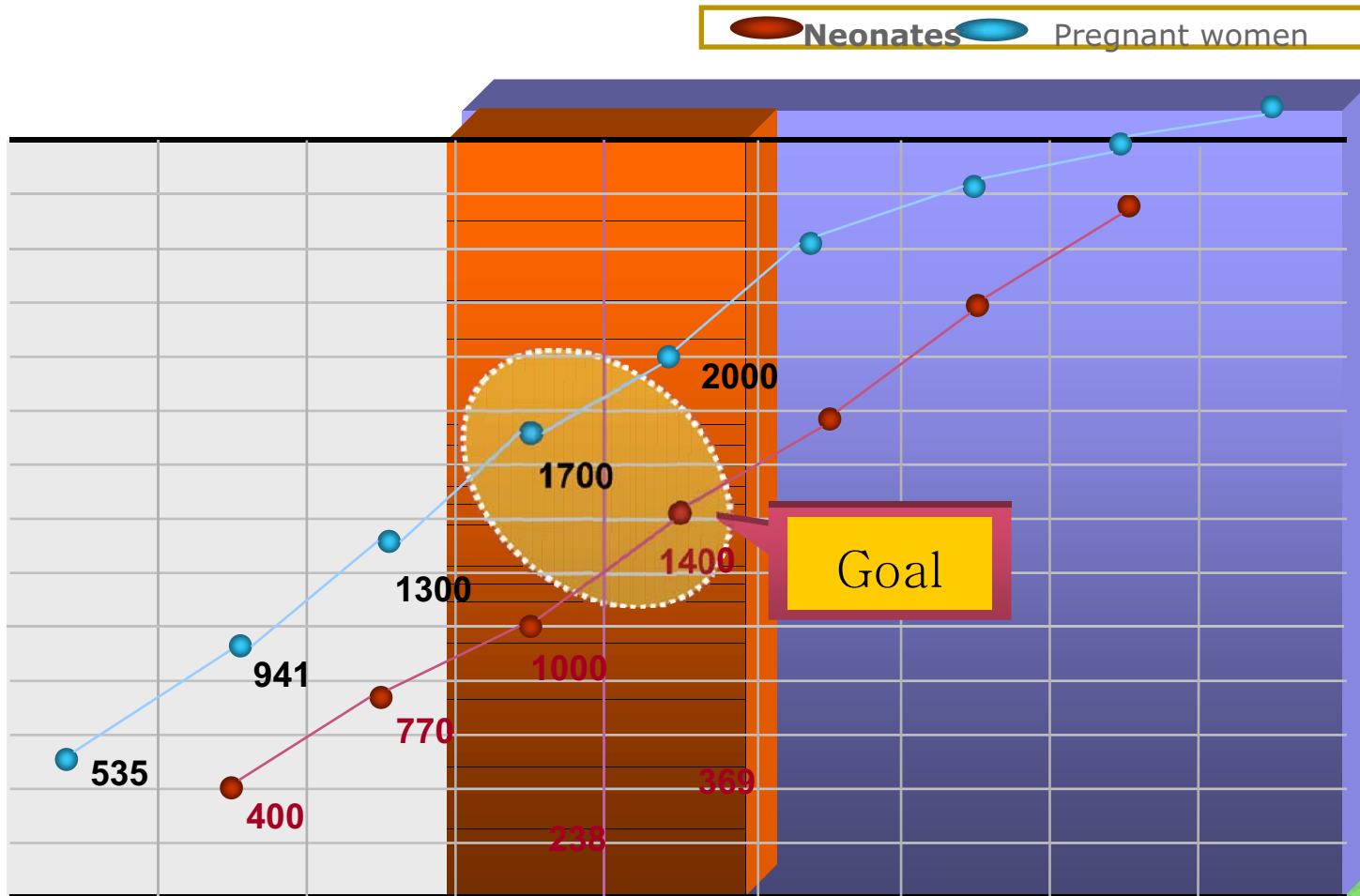
Center in Community

Supported by the Ministry of Environment, Republic of Korea

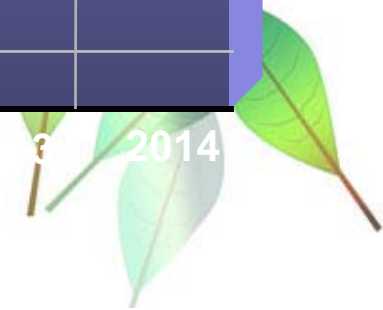
Methods



GOAL of recruitment



2014



Expected Study Population

		2006	2007	2008	2009	2010	total		2011	2012	2013	2014	2015	total
N e w	Father	500	370	300	260	310	1740		270	300	300	305	240	3155
	Mother	500	370	300	260	310	1740		270	300	300	305	240	3155
	Baby	500	370	300	260	310	1740		270	300	300	305	240	3155
F o l l o w U p	12 months		400	296	240	208	1144		248	216	240	240	244	2332
	15			320	237	192	749		166	198	173	192	192	1670
	3Years				256	189	445		154	133	159	138	154	1183
	5years						0		205	152	123	106	127	713
	.						0						164	164
	.						0							0
	.						0							0
Person year	1500	1510	1516	1513	1519	7558		1583	1599	1594	1592	1600	15527	

MOCHE

Study Process



Who will participate in the Study?

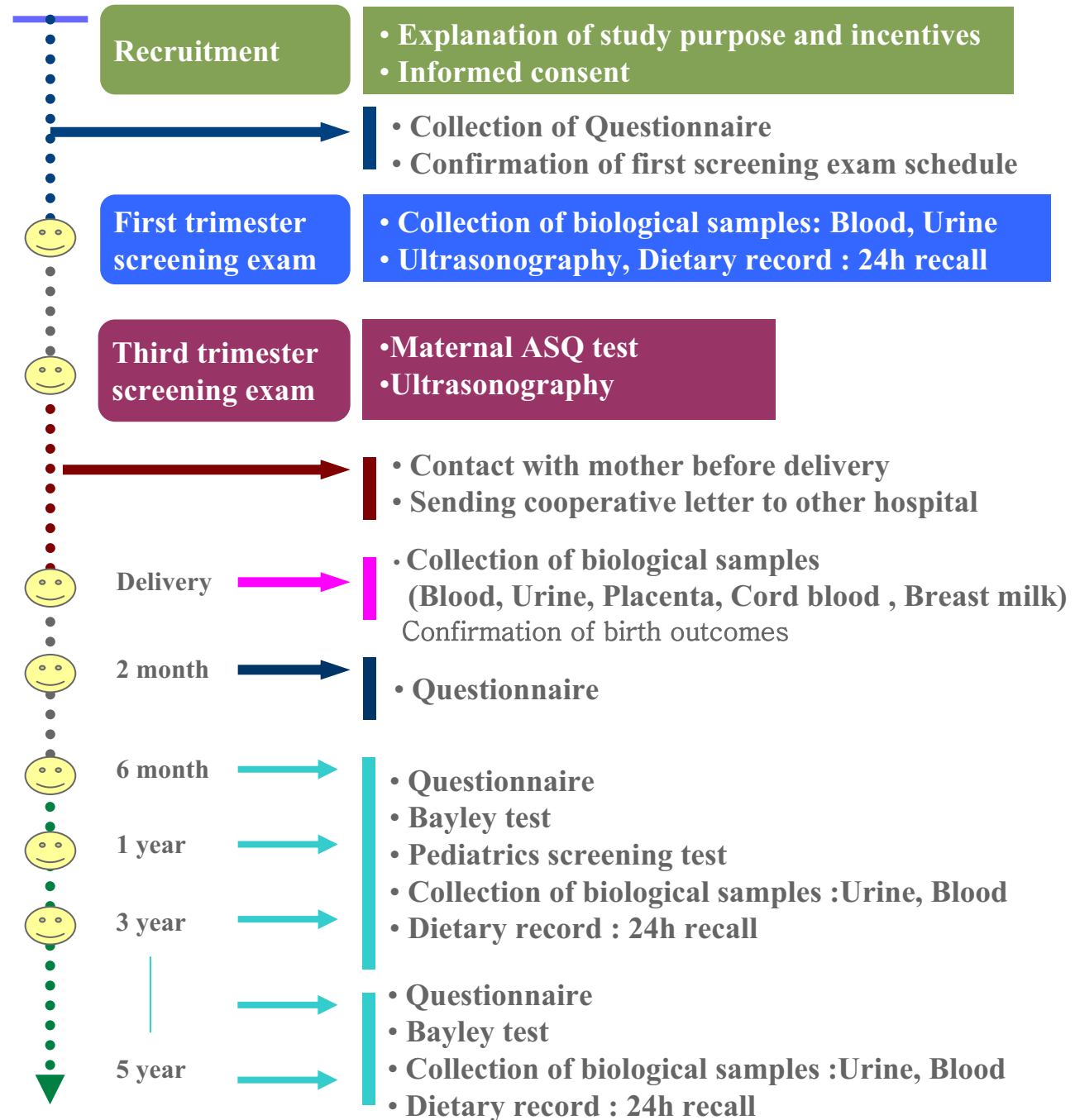
- Between 2005 and 2010, The Mother and Children's Health and Environment study recruits women and their husband who visit the hospital during the early period (before 20weeks) of pregnancy.



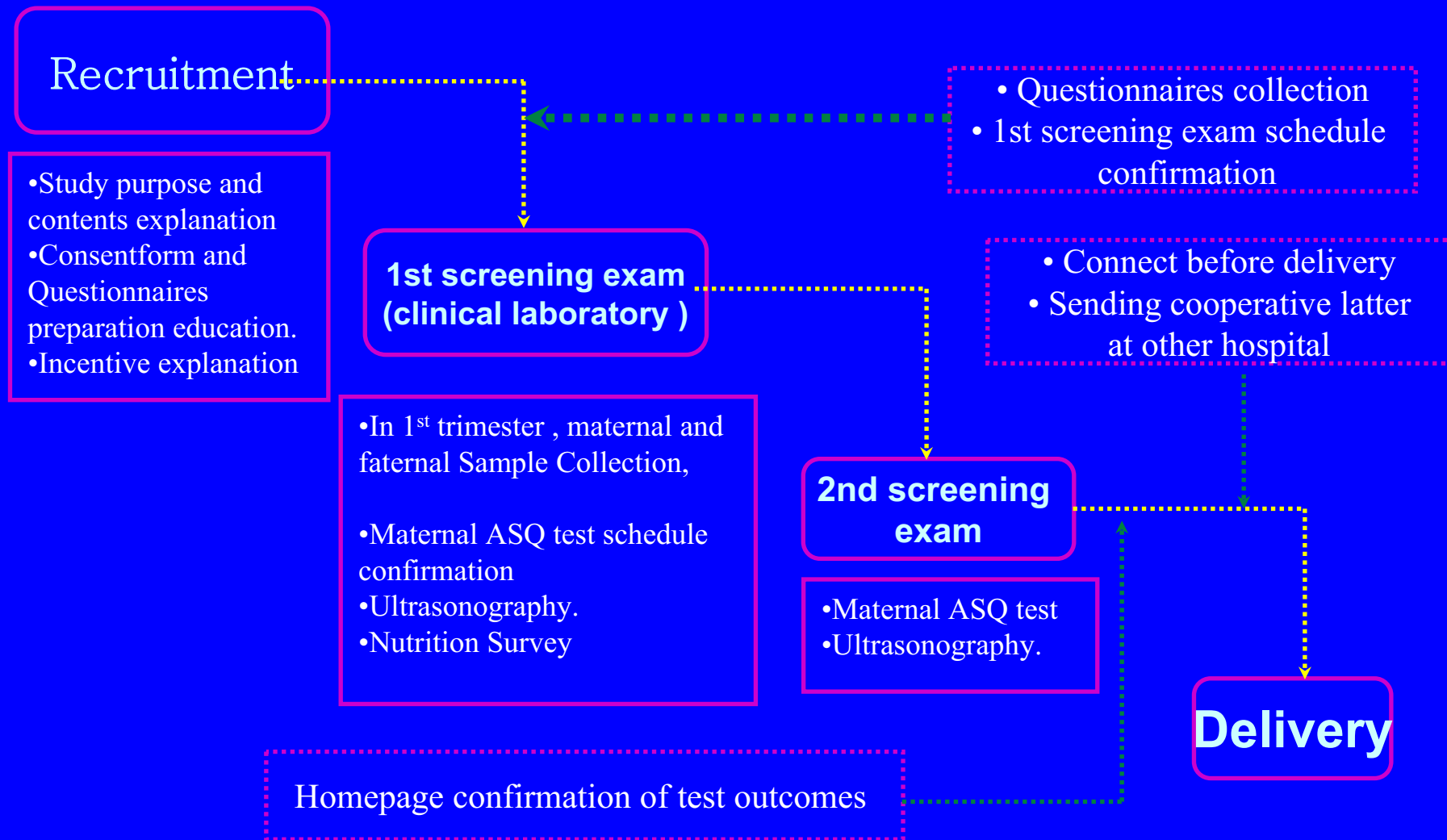
Stage 1.
In the department
of Obstetrics

Stage 2.
In the
Delivery Room

Stage 3.
In the department
of Pediatrics



Stage 1. In the Department of Obstetrics



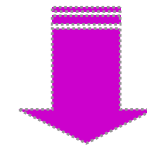
Laboratories in the department of Clinical Lab



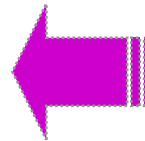
Counseling
by nurse in the
department of
Obstetrics



Bar code system

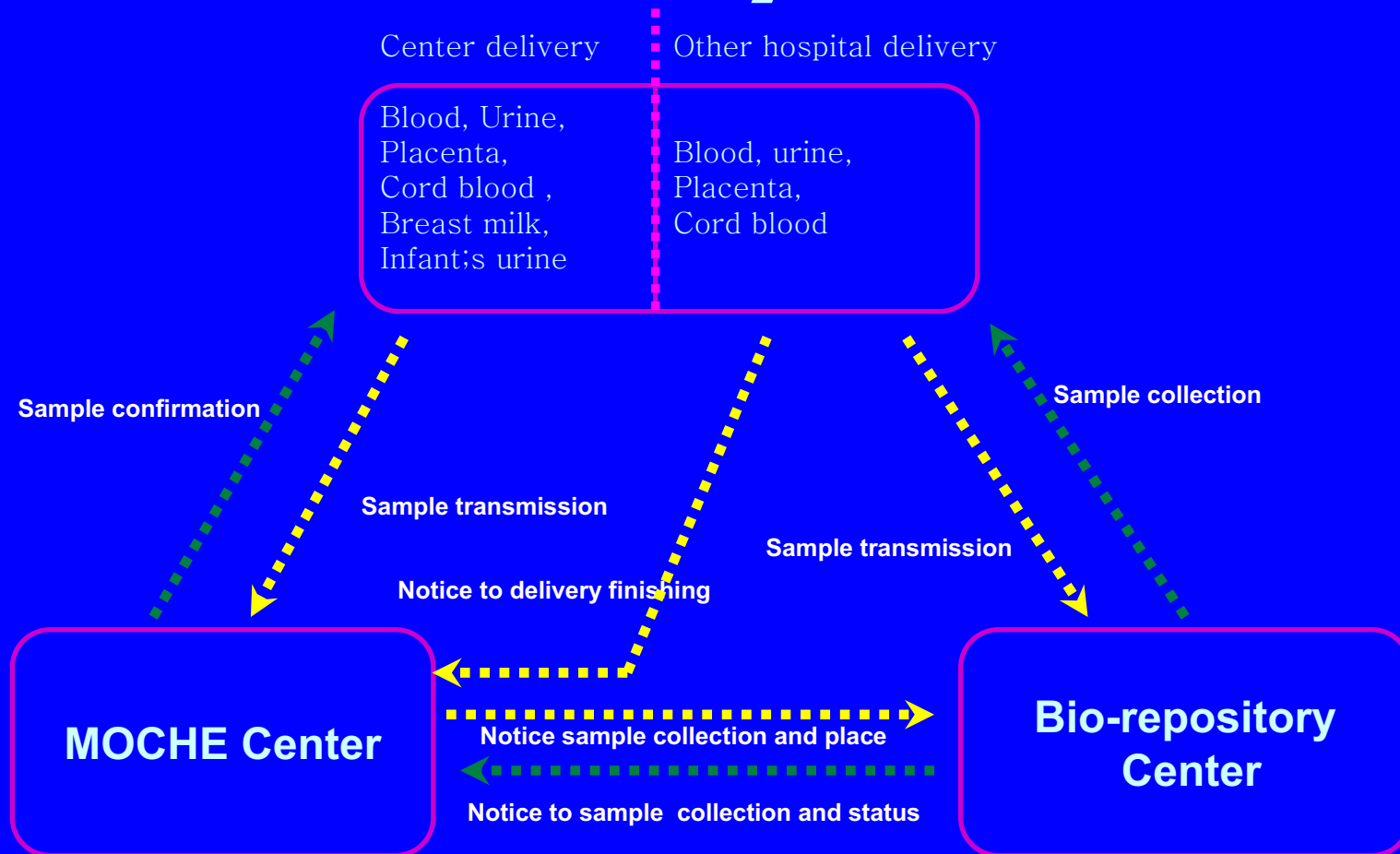


Preparation of transferring

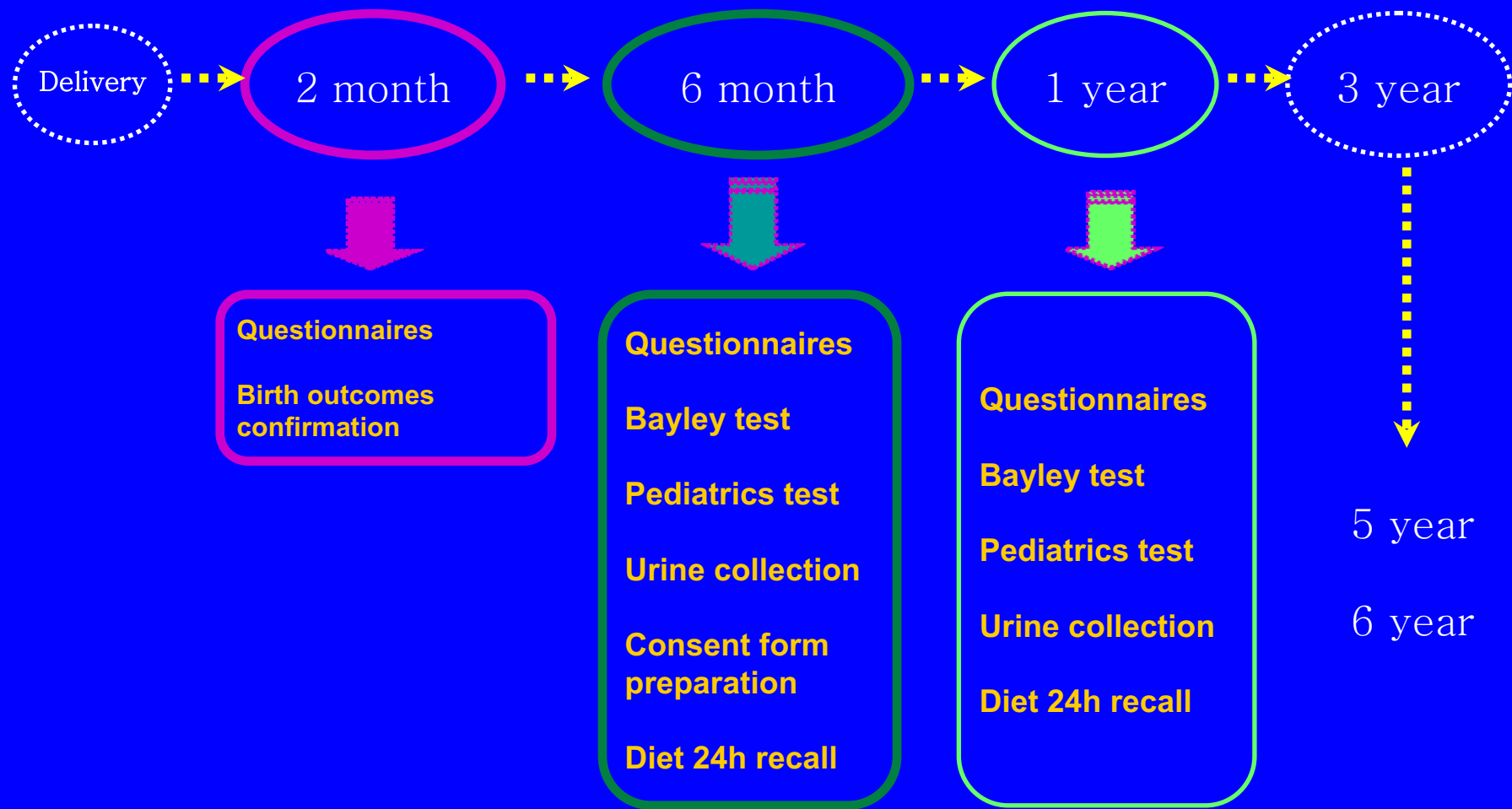


Transfer to
Bio-repository center

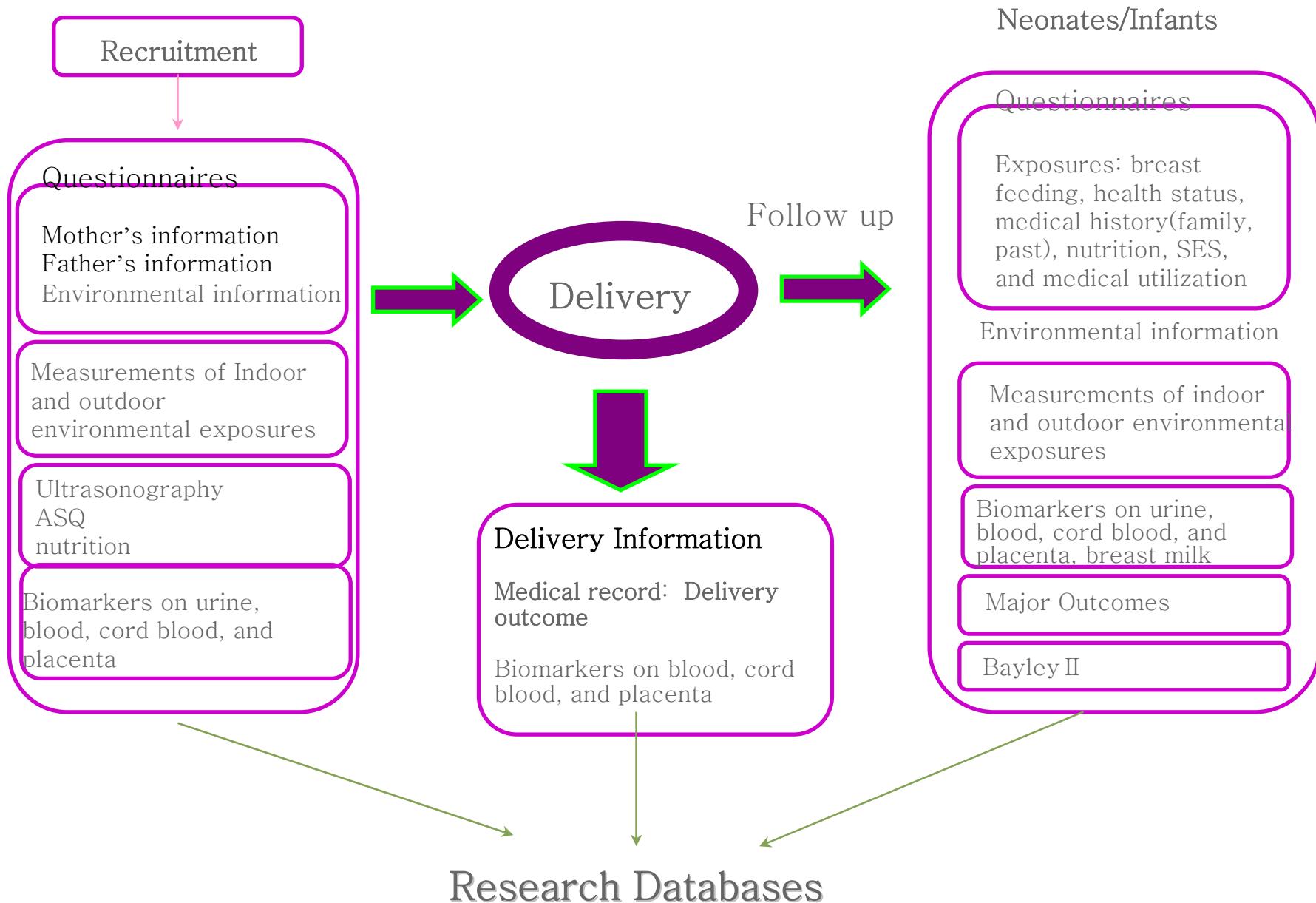
Stage 2. In the Delivery room



Stage 3. In the Department of Pediatrics



Major measurements



Basic information

- **General characteristics:** address, age, height, weight, marital status, number of babies, past history, family history, drug history, medication history, and nutritional supplements
- **Health behavioral factors:** smoking, alcohol drinking, exercise, sleep pattern, stress, and coffee consumption - Socioeconomic status: occupation (employment), education, and income
- **Delivery history:** thelachy, menarchy, parity, gravida, abortion, extrauterine pregnancy, stillbirth, breast feeding, preterm delivery, and low birth weight
- **Medical history:** family & past history
– dietary habits



Environmental information

- **Environmental factors:** physical agents (EMF, cell phone), and amalgam
- **Outdoor:** incinerating facility, landfill, sewerage, factory, industries (including chemical industry), recognition of air pollution and noise, distance from a house to industrial complex, distance from a house to road
- **Indoor:** duration of residence, age of building, presence of humidifier, air conditioner, ventilation, pet, furniture, carpet, aromatic, or insecticide



a. Measurements of Indoor and outdoor environmental exposures

✓ Chemical factors

- VOCs
- NO₂
- HCHO

✓ Dust

- PM₁₀, PM_{2.5}

✓ Biological factors

- Bacteria/ Fungi
- House dust mite
- Endotoxin

✓ Physical factors

- Noise
- Humidity



b. Measurements process



Schedule
identification



- Indoor
- Outdoor
- personal



- Time activity diary
- Basic Environment questionnaire



Analysis



- Outcome output
- Parents/Guardians

c. Environmental information

Domain	Content	Method	Month		
			6	12	24/ 36
Outdoor environment pollution	VOCs, NO ₂ , HCHO, PM ₁₀ , PM _{2.5} , SO ₂ , CO ₂ , O ₃	•Environment measurement (Sampling)	√	√	—
	Incinerating facility, landfill, sewerage, factory, industries (including chemical industry), recognition of air pollution and noise, distance from a house to industrial complex, distance from a house to road	• Maling questionnaire • E-mail	√	√	—
Indoor environment pollution	VOCs, NO ₂ , HCHO, PM ₁₀ , PM _{2.5} , House dust mite, Fungi, Endotoxin, Noise, relative humidity, temperature	•Environment measurement (Sampling : bedroom, living room or kitchen room)	√	√	—
	duration of residence, age of building, presence of humidifier, air conditioner, ventilation, pet, furniture, carpet, aromatic, or insecticide , catching flea, hair spray	•Maling questionnaire • E-mail	√	√	—

Delivery Information

a. Medical record:

- maternal height and weight (pre pregnancy at delivery) blood
- Pressure
- pregnancy related disease

b. Neonates:

- Gender
- Height
- weight
- 1,5' Apgar score



C. Delivery outcome

- **Characteristics at delivery:** delivery date, body weight just before delivery, gestational age, delivery mode, cervical length, placenta weight at delivery, and blood pressure.
- **Complications:** premature rupture of membranes, dystocia, cephalopelvic disproportion, breech presentation or other abnormal position, placenta previa, placenta abruption, meconium aspiration syndrome, obstetrical hemorrhage, fetal asphyxia, precipitating labor, preterm birth, cord prolapse, or eclampsia during labor, fever, or anesthetic complications

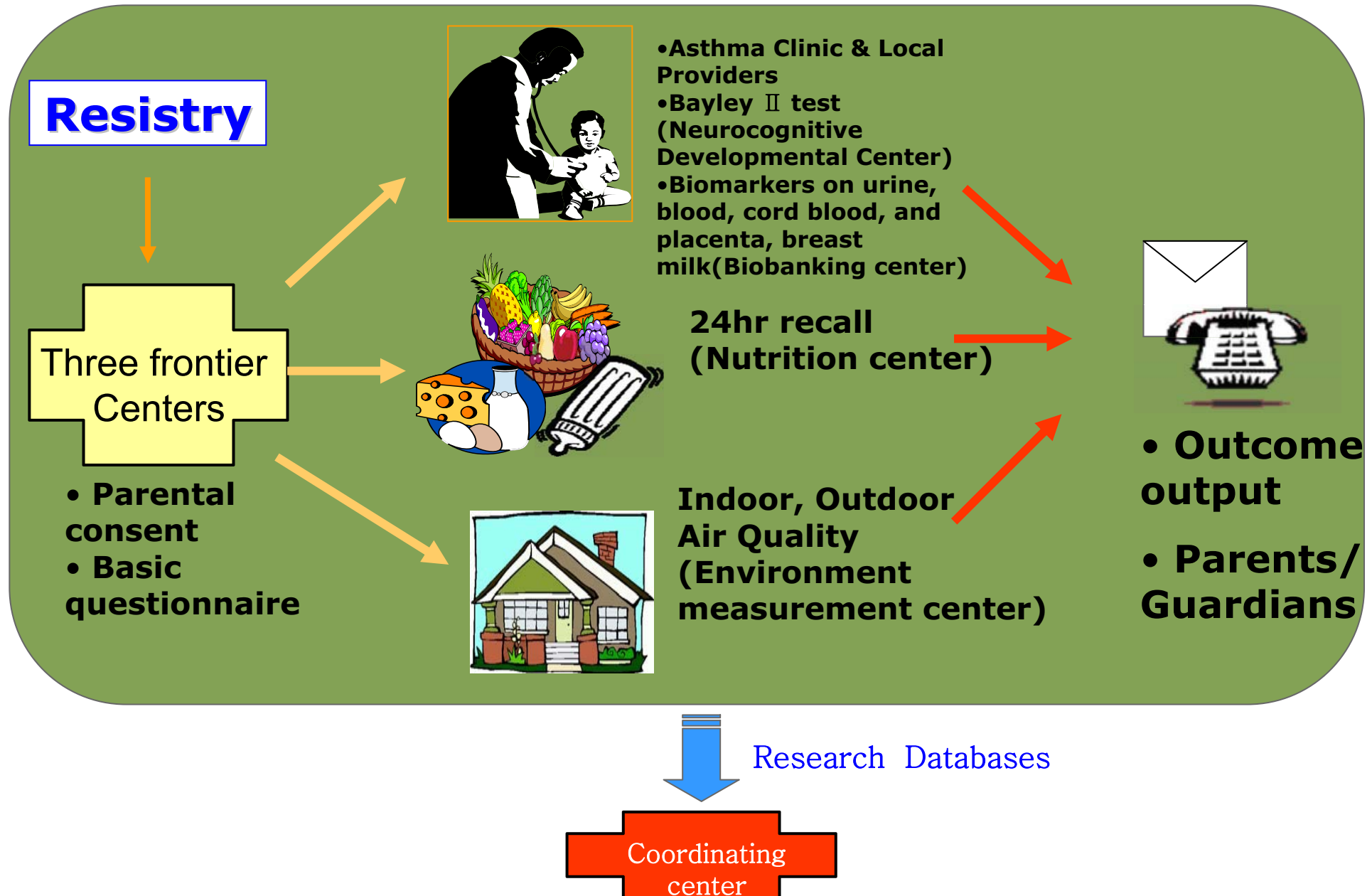
Father's information

- **General characteristics :** address, age, height, weight, marital status, number of babies, past history, family history, and drug history
- **Socioeconomic status:** occupation, education, income level, standard of living, and education
- **Environmental factors:** physical agents (EMF, cell phone), and amalgam
- Outdoor: the same as mother's
- Indoor: the same as mother's

Information of Neonates and Infants

- **Exposures:** breast feeding, health status, medical history(family, past), nutrition, SES, and medical utilization
- **Outcomes:** height& weight, head circumference, blood pressure, Bayley II , IgE, eosiniophil count
- **Outdoor and indoor:** incinerating facility, landfill, sewerage, factory, industries(including chemical industry), recognition of air and noise, distance from house to industrial complex, distance from house to road, duration of residence, years of building, humidifier, air conditioner, ventilation, pet, furniture, carpet, aromatic, and insecticide

Case Identification Process



Biomarkers on urine, blood, cord blood, and placenta

- 1-hydroxypyrene & 2-naphtol
- Cotinine
- Hippuric acid
- hs-CRP
- HDL-cholesterol
- TG
- Folic acid
- Pb, Hg, Cd,
- Phthalate
- BPA
- Malondialdehyde (MDA)
- GSTM1/T1

