Prevalence of GDM in Thailand:

National-scale data
- No reliable national-scale data available

Hospital-based data
- Prevalence of abnormal screening
  - Siriraj Hospital: 33.0%
  - Thammasat University Hospital: 36.3%
- Prevalence of GDM

<table>
<thead>
<tr>
<th>Time</th>
<th>2007</th>
<th>2008</th>
<th>2011</th>
<th>2017</th>
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<tbody>
<tr>
<td>Siriraj Hospital</td>
<td>5.53</td>
<td></td>
<td></td>
<td>11.99</td>
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<tr>
<td>Thammasat Hospital</td>
<td>4.12</td>
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<tr>
<td>Bhumidol Hospital</td>
<td>20.17</td>
<td></td>
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<tr>
<td>Chonburi Hospital</td>
<td></td>
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**DM in Pregnancy, Siriraj Hospital**

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<tr>
<th>Type</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>Total</th>
<th>%</th>
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<tbody>
<tr>
<td>Pre-existing DM</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Insulin-dependent</td>
<td>31</td>
<td>12</td>
<td>10</td>
<td>43</td>
<td>39</td>
<td>42</td>
<td>42</td>
<td>35</td>
<td>14</td>
<td></td>
<td>324</td>
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<td>Non-insulin-dependent</td>
<td>15</td>
<td>11</td>
<td>7</td>
<td>16</td>
<td>26</td>
<td>36</td>
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<td>73</td>
<td>31</td>
<td>33</td>
<td>315</td>
<td>0.35</td>
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<td>Unspecified</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
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<td>0</td>
<td>4</td>
<td>4</td>
<td>11</td>
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<td>GDM</td>
<td>447</td>
<td>475</td>
<td>462</td>
<td>445</td>
<td>594</td>
<td>706</td>
<td>886</td>
<td>954</td>
<td>840</td>
<td>893</td>
<td>6,702</td>
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<tr>
<td>Total</td>
<td>493</td>
<td>499</td>
<td>480</td>
<td>504</td>
<td>660</td>
<td>791</td>
<td>983</td>
<td>1,069</td>
<td>930</td>
<td>943</td>
<td>7,352</td>
<td>8.26</td>
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<tr>
<td>Total of delivery</td>
<td>8,923</td>
<td>8,920</td>
<td>8,992</td>
<td>9,234</td>
<td>9,710</td>
<td>9,500</td>
<td>9,050</td>
<td>8,880</td>
<td>7,973</td>
<td>7,862</td>
<td>89,044</td>
<td>11.99</td>
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</tbody>
</table>

**Out – patient 3,040,613 Visit**
- Obstetrics: 74,368 Visit
- Gynecology: 161,804 Visit
- Delivery: 7,862 Case

**Impact of GDM in Thailand**:
- No both small-scale and large scale studies about impact of GDM.
- We urgent need to find out the impact of GDM in various aspects
  - Economic Impact
  - Social and family impact
  - Life style, quality of life and life long impact
  - Pregnancy outcome impact

**Effort to combat**
Early Life Nutrition Network Thailand

Assoc. Prof. Vitaya Titapant
Chairman
Early Life Nutrition Network Thailand

Update October 2018

How network established? 1.

- Fragmented awareness/knowledge of ELN
- Low integration of ELN key stakeholders
- No national ELN agenda

"there is a clear need of an organization to integrate ELN knowledge from different groups of stakeholders to drive for effective actions to improve ELN awareness in Thailand"
How network established? 2.

- Independent network of experts in ELN
- Non-government, non-profit, flexible organization
- Key objectives:
  - Integrate ELN knowledge for healthcare professionals
  - Promote ELN awareness to public
  - Define local ELN research agenda

Organized 16 Conferences 2014-2018

16 conferences for 5,042 HCPs from 1,520 healthcare facilities in 66 out of 77 provinces nation-wide

Participant by professionals:
- Nurses 65%
- Doctors 13%
- Medical students 5%
- Nutritionists 7%
- Public Health Workers 4%
- Others 6%

Participant by provinces

> 5,000 copies of 3 annual conference textbooks for HCPs

| ELN Awareness, 2014-15 | Anemia in Pregnancy & Childhood Obesity, 2016-17 | GDM & ELN Challenges, 2018-19 |

>200,000 copies of 8 educational booklets to Mums via HCPs

- Proper pre-pregnancy weight
- Future health determined in the womb
- Allergy risk prevention
- Pregnancy exercise
- CMPA prevention
- Pregnancy nutrition: right or wrong?
- Healthy pregnancy weight gain
- Nutrition for smart kids
**Issues to be considered**

- Population selection
- Screening method
- Glucose concentration
- Criteria for diagnosis
- Timing for Screening and diagnosis

**Steps for Screening and Diagnosis 1.**

**Step 1. Population selection**

- **Selective Screening**
  - Screening in high-risk groups for GDM
  - *Suggested by many organizations*

- **Universal Screening**
  - Screening in every pregnant woman
  - *Suggested by FIGO*
**Steps for Screening and Diagnosis 2 & 3**

**Step 2: Selection of Screening Method**

**One-Step Screening**

**Siriraj Hospital**

- Plasma glucose level for 50 gm 1-Hr GST
  - High level in the first screen with negative OGTT, high chance of diagnosed GDM in the second screen
  - >200 mg/dL, GDM can be diagnosed without 100 gm OGTT

- 50 gm 1-Hour GCT
- 75 gm OGTT
- 100 gm OGTT

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**SIRIRAJ HOSPITAL 2018: UNIVERSAL SCREENING**

**THE OUTCOME WILL BE EVALUATED IN THE NEXT 2 YEARS.**

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**Steps for Screening and Diagnosis 4.**

**For 100 gm OGTT**

**Siriraj Hospital**

- Diagnostic criteria were changed from NDDG to CC Criteria since 2012
- Incidence of GDM increased 32.76%

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**Interpretation**

- Abnormal value > 2 = GDM
- NDDG = National Diabetes Data Group

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**Steps for Screening and Diagnosis 5.**

**Step 5: Timing for Screening and diagnosis**

- **Siriraj Hospital**
  - Early Screening before 20 weeks =>
  - increase diagnosed GDM for 50%
Classification of GDM 1.

Class A1
Diet-Controlled GDM

Class A2
Medication-Controlled GDM

Controlled- GDM
FPG < 105 mg/dL AND
2-Hr PPG < 120 mg/dL

Classification of GDM 2.

- Diagnosis of GDM Class A2 at Siriraj Hospital
- Failure Structured Diet Therapy
  2 Steps of Structure Diet Therapy
     1. Ambulatory Diet Therapy
     2. Intensive Diet Therapy

Siriraj Hospital
Decrease 60% of Insulin Usage

Impact on maternal and Birth Outcomes Siriraj Hospital

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
</tr>
<tr>
<td><strong>Maternal Outcome</strong></td>
<td></td>
</tr>
<tr>
<td>PPH</td>
<td>10.5</td>
</tr>
<tr>
<td>Preeclampsia</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Neonatal Outcome</strong></td>
<td></td>
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<tr>
<td>Hypoglycemia</td>
<td>68.5</td>
</tr>
<tr>
<td>Macrosomia</td>
<td>17.9</td>
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</tbody>
</table>

* After using Carpenter-Coustan Criteria and enrolled in glycemic control program.
**Objective**: To compare maternal and neonatal complications of gestational diabetes mellitus (GDM) between conservative and systematic management.

**Material and Method**: This retrospective cohort study was conducted at Thammasat University Hospital, Thailand. GDM subjects who were diagnosed and treated from October 2004 to March 2007 were classified as the conservative management group (CMG). The participants who were diagnosed and treated from April 2007 to September 2009 were classified as the systematic management group (SMG). SMG was ambulatory-managed per standard protocol by a multidisciplinary team (physician, diabetes nurse case manager, nutritionist and pharmacist).

**Results**: There were 87 and 118 subjects in CMG and SMG, respectively. Mean age and body mass index before pregnancy in CMG and SMG were not statistically different. Oral glucose tolerance tests (50 and 100 gram) were similar in both groups. The prevalence of GDM A2 was 57.5 and 55.1% in CMG and SMG, respectively. Mean gestational age at DM clinic consultation and number of hospital admission of SMG was less than CMG (p<0.001). Other composite maternal and neonatal outcomes were not different in either group.

**Conclusion**: Systematic management by a multidisciplinary team conducted according to a practical guideline has the benefit of neonatal hypoglycemia reduction and hospital admission included postpartum DM surveillance increments.
Challenges Faced 1.

- Reliable GDM Data at national level
- Screening Method
  - Universal/ risk-based screening
  - One step/ two step method
    - 100 g OGTT/ 75 g OGTT
- Diagnostic criteria
  - NDDG/ ADA/ WHO/ IADPSG/ Others criteria

Comparison of the Screening Tests for Gestational Diabetes Mellitus between “One-Step” and “Two-Step” Methods among Thai Pregnant Women
Obstetrics and Gynecology International, Volume 2018

**Conclusion.** The one-step approach is associated with very high prevalence of GDM among Thai population, without clear evidence of better outcomes. Thus, this approach may not be appropriate for screening in a busy antenatal care clinic like our setting or other centers in developing countries.

**Results.** A total of 648 women were screened: 278 in the one-step group and 370 in the two-step group. The prevalence of GDM was significantly higher in the one-step group; 32.0% versus 10.3%. Baseline characteristics and pregnancy outcomes in both groups were comparable. However, mean birthweight was significantly higher among pregnancies with GDM diagnosed by the two-step approach (3204 ± 555 versus 3009 ± 666 g). Likewise, the rate of large-for-date tended to be higher in the two-step group, but was not significant.

**Conclusion.** The one-step approach is associated with very high prevalence of GDM among Thai population, without clear evidence of better outcomes. Thus, this approach may not be appropriate for screening in a busy antenatal care clinic like our setting or other centers in developing countries.

Prevalence of Gestational Diabetes Mellitus Detected by International Association of the Diabetes and Pregnancy Study Groups (IADPSG) Criteria in Phramongkutklao Hospital
Thai Journal of Obstetrics and Gynaecology , July 2015

**Objective:** To determine the prevalence of gestational diabetes mellitus (GDM) diagnosed with International Association of the Diabetes and Pregnancy Study Groups (IADPSG) criteria and identify risk factors of GDM in pregnant women who attended antenatal clinic at Phramongkutklao Hospital.

**Materials and Methods:** This was a descriptive study. Pregnant women who underwent antenatal visit at Phramongkutklao Hospital from December 2013 to September 2014 were enrolled and universal screening for GDM was done. After exclude multi-fetal pregnancy and overt DM, the remaining subjects were reviewed for age, gravidity, parity, gestational age, and other risk factors. A 2-hours 75 gm oral glucose tolerance test was performed. The prevalence of pregnant women with GDM and risk factor for GDM among selected population were the outcome measures.

**Results:** Three hundred and twenty-five pregnant women were included. Mean age was 29.72 years old. One hundred and eight women was in high risk group (33.23%), 193 (59.38%) and 24 (7.39%) women were identified in average and low risk group, respectively. The prevalence of GDM was 21.8%, which is comparable to reported range from previous studies. Risk factors associated with GDM was age ≥ 35 years.

**Conclusion:** The prevalence of pregnant women with GDM in antenatal clinic at Phramongkutklao Hospital diagnosed with IADPSG criteria was 21.8% and the risk factor for GDM was age ≥ 35 years.

Challenges Faced 2.

- **Population at risk?**
  - Average risk
    - SEA
  - High risk
    - Obesity BMI, Advanced Age, Glucosuria, etc

- **Impact of GDM**
  - Large scale
    - Economic
    - Society
  - Small Scale
    - Maternal and neonatal outcome
Current and Future Plans

- Establish reliable data of GDM at national level
- Early detection
  Definite guideline
- Early management and prevention
  Primary, secondary and tertiary care
- Achieve glycemic control
  SMBG
  Ultrasonogram for fetal abdominal wall thickness
  Home visit
  Online management/application
- Early prevention in postpartum and long term follow up
- Study of impact on economics, society and quality of life