**MEMORANDUM**

**PROJECT:** SwissRe breast cancer screening

**FROM:** Nicole Young

**DATE:** June 9th 2020

**RE:** Breast cancer screening tree for Chinese women

**BACKGROUND**: This memo compiles the screening guidelines from China Anti-Cancer Association and National Clinical Research Center for Cancer (Tianjin Medical University Cancer Institute and Hospital) for average and high risk Chinese women1,2. These guidelines are then interpreted to devise the screening tree for the Screening Model 2.

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| **Risk group** | **Guideline age of screening onset** | **Breast type** | **Model age of screening onset** | **Screening regularity** | **Screening recommendation** | | | **Modelling decisions:** |
|  |  |  |  |  | *Primary* | *Secondary* | *Tertiary* |  |
| Average | 40-44 | regular | **-** | Opportunistic | MAM |  |  |  |
|  | dense | **-** | Opportunistic | MAM | BUS |  | Not modelling dense breast |
| 45-69 | regular | **30-69 Branch D** | Biennial | MAM |  |  | All average risk will be modelled as this |
|  | dense | **-** | Regular | MAM | BUS |  | Not modelling dense breast |
| 70+ |  | **70+** | Opportunistic | MAM |  |  |  |
| High risk without family history | 40-44 |  | **30-44 Branch B** | Annual | BUS | MRI |  | MRI is a level C recommendation which is less important so we are not modelling |
| 45-69 |  | **45-69 Branch C** | Annual | MAM | BUS | MRI |
| High risk with family history | 35-69 |  | **30-69 Branch A** | Annual | MRI |  |  |  |
| MAM: mammography; BUS: breast ultrasound; MRI: magnetic resonance imaging | | | | | | | | |

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| **Guideline definitions** | **Model definitions** |
| **Average risk:** Women who do not have a high risk of breast cancer (refer to the definition of women with a high-risk of breast cancer). | **Average risk:**  Women who are not high risk |
| **High risk:**  Women who meet at least one of the following criteria:  (1) women with at least two first/second-degree relatives ever diagnosed with breast cancer;  (2) women with at least one first-degree relative carrying known BRCA1/2 pathogenic genetic mutations;  (3) women with at least one first-degree relative ever diagnosed with breast cancer and with at least one of the following:  (a) one first-degree relative with age at diagnosis of breast cancer equal to or younger than 45 years;  (b) one first-degree relative with age at diagnosis of breast cancer from 45 years to 50 years and at least one first-degree relative ever diagnosed with ovarian epithelial cancer, fallopian tube cancer or primary peritoneal cancer at any age;  (c) one first-degree relative with two primary breast cancers and age at diagnosis of first primary breast cancer equal to or younger than 50 years;  (d) two first-degree relatives ever diagnosed with ovarian epithelial cancer, fallopian tube cancer or primary peritoneal cancer at any age;  (e) one male first-degree relative with breast cancer;  (4) women carrying known pathogenic genetic mutations associated with breast cancer;  (5) women with at least one first-degree relative ever diagnosed with hereditary tumor syndrome, such as hereditary breast and ovarian syndrome, Cowden syndrome, Li-Fraumeni syndrome, Peutz-Jeghers syndrome, or Lynch syndrome, etc.;  (6) **women ever diagnosed with moderate to severe dysplasia in the breast duct/lobule or lobular carcinoma *in situ*;** or  (7) women ever received chest radiotherapy. | **High risk:**   1. - (5) classified as **with family history** 2. As **with previous diagnosis of DCIS/LCIS** 3. Not modelling this population, so will be considered average risk |

Model decision tree based on the above:

Potential assumptions and limitations:

1. Our high risk category does not capture all high-risk women, esp (7) those ever received chest radiotherapy. Therefore, our screening model might be not capture all high risk women described in (7) in the high risk group. These women will be misclassified in the average risk group and be screened every 2 years. Thus the modelled ‘average risk’ screening group (biennal screenings) will have will have higher breast cancer incidence than the real life average screening group. This group is screened less; the model will under-estimate pay out. By how much depends on what proportion high risk is (7) and the RR of (7) compared to average risk.
2. It’s important to note the exposure groups where we obtain the RR for family history. The exposed group should contain as much of 1-5 as possible.
3. The model starts screening at age 30, whereas current guidelines start at age 40.

**References**:

1 Huang Y, Tong Z, Chen K, *et al.* Interpretation of breast cancer screening guideline for Chinese women. 2019; **16**: 11.

2 Health Commission of PRC N, National Health Commission of the People’s Republic of China. Chinese guidelines for diagnosis and treatment of breast cancer 2018 (English version). *Chin J Cancer Res* 2019; **31**: 259–77.