

S3 Material. Carcinoma *in situ* incidence in Korea, 2018

Carcinoma *in situ*, classified by the behavior code (i.e., the final digit from the histology codes of *International Classification of Diseases for Oncology, 3rd edition* [ICD-O-3]) “/2 (carcinoma *in situ*),” is a special form of neoplasm defined as a group of abnormal cells that remain in the place where they first formed and do not spread to other nearby tissues or organs. Although the KCCR has compiled records of both malignant cancer (behavior code “/3”) and carcinoma *in situ* so far, the national statistics of incidence for carcinoma *in situ* was generated for the first time using 2018 KNCI DB. A brief summary of those results is provided here.

In total, 27,167 people were newly diagnosed with carcinoma *in situ* in Korea, in 2018, of which 9,290 (34.2%) were men and 17,877 (65.8%) were women (S4 Table). The CR of overall carcinoma *in situ* in 2018 was 53.0 per 100,000 (36.3 per 100,000 for men; 69.6 per 100,000 for women). Uterine cervix, colorectal, breast, stomach, bladder, and skin were major sites for *in situ* carcinoma where the neoplasm had been commonly diagnosed in both sexes; uterine cervix and breast accounted for 70.7% of carcinoma *in situ* cases in women, whereas colorectum and bladder accounted for nearly 70% of carcinoma *in situ* cases in men. Collectively, *in situ* cases diagnosed at the six most common sites in Korea occupied 92.4% of all carcinoma *in situ* cases. In terms of age-specific incidence rates, women and men demonstrated the highest incidences for carcinoma *in situ* in their 30s and 40s, and 70s and over, respectively (S5 Fig.). This discrepancy was attributed to the difference in the preferred age group in which the major carcinoma *in situ* cases, in each sex, had been mainly diagnosed.

S6 Fig. depicts the trends in carcinoma *in situ* incidence cases from 1999 to 2018. Although the completeness of *in situ* data during the early years of cancer registration would fall short of the current level, the overall trend for carcinoma *in situ* cases in Korea was steady and

increased remarkably. In detail, the entire *in situ* neoplasms demonstrated significant increase until 2016 by 10.9% per year, which converted to a nonsignificant trend thereafter (S7 Table). Except for stomach, *in situ* carcinomas in other major sites in Korea were still on an increasing trend, although most slopes of change had been relatively attenuated in recent years.

Secular trends in the incidence rates of overall cancer, including both malignant cancer and carcinoma *in situ* (which are registered in the Korea National Cancer Incidence Database [KNCI DB]), for selected sites are illustrated in S8 Fig. A relative volume of carcinoma *in situ*, compared to the overall cancer occurring in each site, was the highest in uterine cervix; herein, compared to malignant cancer, the incidence of carcinoma *in situ* have proceeded that of malignant cancer since 2005. In recent years, *in situ* carcinomas of stomach, colorectum, uterine cervix, and bladder have increased either slightly or markedly, despite observed decreases in their malignant cancer incidence rates; whereas the incidence rates for both carcinoma *in situ* and malignant cancers have increased simultaneously for breast and skin.

The increase of carcinoma *in situ* described above appears to be largely attributable to increased cancer screening in Korea. Such a transition is meaningful in that it can prevent the occurrence of malignant cancer by the early detection and removal of precancerous (including carcinoma *in situ*) lesions. Based on the monitoring results of cancer statistics, including *in situ* carcinomas, the effects of cancer prevention through appropriate interventions, such as screening, can be evaluated.