

**Appendix SI.**

## SUPPLEMENTARY MATERIALS AND METHODS

### *Data source and study population*

This study utilized data from the NHIS database gathered from January 2006 through December 2015. NHIS data collection was supervised by the Korean NHI service, which monitors whole medical services. The whole South Korean population is covered by the NHIS. This computerized database includes all insurance claim data, such as patient demographics, date of hospital visits, place of residence, socioeconomic status, and claimed treatment details based on the ICD-10 codes. The Korean NHI service is a universal healthcare system in South Korea, and covers the entire population of over 49 million people.

### *Study population*

Data from patients over 40 years of age with a diagnostic code (ICD-10) of AK (L570) who visited clinics or hospitals more than once in a given year from January 2006 to December 2015 were analysed. An incident case was defined as a person who was newly diagnosed and registered as an AK patient in the corresponding year. The incidence was calculated by dividing the number of new

cases in the corresponding year by the total population. A prevalent case was defined as a person registered in the NHIS database as an AK patient in the corresponding year including patients registered as incident cases in previous years. The prevalence was calculated by dividing the number of prevalent cases in the corresponding year by the total population. A cohort study of the association between AK and Bowen's disease (BD) (D04), melanoma (C43) or NMSC (C44) was conducted, with an observation period of up to 10 years. Patients who had developed AK, BD, or skin cancer were excluded before the entry date. The definition of NMSC in this study included BCC, SCC, and other rare subtypes. The study was approved by the Institutional Review Board of the Korean National Institute for Bioethics Policy (NHIS-2017-1-002). The Institutional Review Board at the Korea Centers for Disease Control and Prevention approved the protocol, and all participants signed informed consent. The present study was also approved by the Institutional Review Board of the Catholic University of Korea (approval number KC17ZESI0126).

### *Study variables*

NHIS data were interpreted to calculate the national incidence of AK for all South Koreans. The 2015 incidence was also analysed for participants, who were classified into 5 age groups as follows: 40–49, 50–59, 60–69, 70–79, and over 80 years.

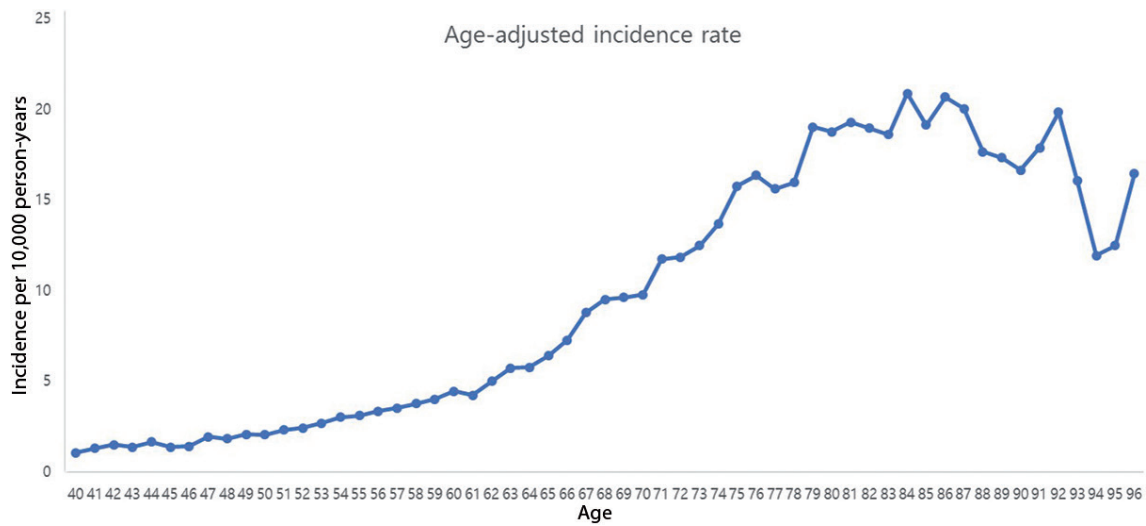


Fig. S1. Age-adjusted incidence rate of actinic keratosis in 2015.

**Table SI. Incidence per 100,000 individuals and prevalence of actinic keratosis in 2006 to 2015**

Year	Person-years	Events	Incidence/ 100,000 person-years	Age-adjusted incidence/100,000 person-years	People <i>n</i>	Events	Prevalence/ 100,000 people	Age-adjusted prevalence/ 100,000 people
2006	19,654,265	3,526	17.94	19.57	19,663,699	4,338	22.06	24.17
2007	20,241,839	4,111	20.31	21.84	20,254,658	5,132	25.34	27.39
2008	21,166,127	4,793	22.65	24.02	21,182,960	6,051	28.57	30.45
2009	21,908,660	5,849	26.70	28.15	21,929,992	7,511	34.25	36.20
2010	22,632,471	6,161	27.22	28.32	22,659,240	8,316	36.70	38.27
2011	23,329,548	7,832	33.57	34.51	23,361,932	10,370	44.39	45.71
2012	24,064,665	9,012	37.45	38.13	24,104,204	12,137	50.35	51.32
2013	24,706,199	10,362	41.94	41.94	24,753,810	14,185	57.30	57.23
2014	25,360,995	12,289	48.46	48.03	25,417,875	16,929	66.60	65.81
2015	26,003,166	14,040	53.99	52.86	26,071,512	19,824	76.04	74.06

**Table SII. Incidence per 10,000 individuals and prevalence of actinic keratosis according to age in 2015**

Age, years	Total			Male			Female			Total			Male			Female					
	Person-years	Events	Incidence/10,000 person-years	Person-years	Events	Incidence/10,000 person-years	Person-years	Events	Incidence/10,000 person-years	Person-years	Events	Incidence/10,000 person-years	Person-years	Events	Prevalence/10,000 people	People (n)	Events	Prevalence/10,000 people	People (n)	Events	Prevalence/10,000 people
40-49	8,927,666	1,474	1.66	4,532,948	684	1.51	4,394,718	790	1.80	8,934,467	1,742	1.95	4,535,856	812	1.79	4,398,611	930	2.11	4,398,611	930	2.11
50-59	8,198,382	2,652	3.24	4,116,128	1,277	3.10	4,082,254	1,375	3.37	8,210,181	3,282	4.00	4,121,285	1,598	3.88	4,088,896	1,684	4.12	4,088,896	1,684	4.12
60-69	4,677,402	3,238	6.92	2,269,379	1,616	7.12	2,408,023	1,622	6.74	4,691,566	4,424	9.43	2,276,167	2,278	10.01	2,415,399	2,146	8.89	2,415,399	2,146	8.89
70-79	3,102,841	4,571	14.73	1,319,690	1,752	13.28	1,783,151	2,819	15.81	3,124,667	6,843	21.90	1,327,943	2,631	19.81	1,796,724	4,212	23.44	1,796,724	4,212	23.44
80-89	1,096,875	2,105	19.19	341,497	535	15.67	755,378	1,570	20.78	1,110,631	3,533	31.81	345,069	926	26.84	765,562	2,607	34.05	765,562	2,607	34.05