Good morning everyone. I will be discussing two abstracts. The first abstract is Environmental Pollutants and Molecular Alterations in Non-Small Cell Lung Cancer, Insights from KBP 2020 cohort study.

This is declaration of interest. So air pollution is a proven risk factor for lung cancer classified as a carcinogenic to humans IARC group 1. Estimated more than 2,60,000 lung cancer deaths per year are due to air pollution. Effect mainly is demonstrated for a particular matter less than 2.5 micrometer.

Meta-analysis has reported that a relative risk of lung cancer incidence of 1.07 to 1.16 for 10 microgram per meter square increment in PM 2.5 levels. Similar impacts observed in non-smoking objects also. The exact mechanism of pollutants leading to lung cancer is still poorly understood and the impact on tumor characteristics are largely unknown.

Recently, Hill et al., they have contributed a major advance in understanding the impact of PM2.5 on lung cancer incidence. They established the epidemiological link between PM2.5 and EGFR mutated non-small cell lung cancer. They found that PM2.5 can provide a tumor progression in both oncogenic KRAS and EGFR model of lung adenocarcinoma through an inflammatory response mediated by

IL-1 beta pathway. This study was to confirm the epidemiological association while controlling for major confounding factors and to gain further insight into links between air pollution and tumor characteristics. The objective of study was to confirm the association of particulate matter 2.5 with EGFR mutations adjusting on smoking, status, age and gender and to perform subgroup analysis.

Other objective was to study association of other pollutants with EGFR mutation, to study the association of pollutants with other driver oncogenes, to study the association of exposure to radon with driver oncogene, and to study the association of pollutants with IO predictive biomarkers like PD-L1 expression and STK11 mutations. A unique series of epidemiological longitudinal cohorts, it was

Observational prospective studies participating centers were from French non-academic public hospital. It was performed in 2000, 2010 and 2020. Available data on patient and disease characteristic was analyzed. This KBP cohort, this represented 20% of all lung cancer diagnosed in France in 2020.

For this analysis, only patients with non-squamous NSCLC and 4-home, the ZIP code was known were included. Patients living outside the metropolitan France were excluded because of lack of comprehensive pollution data. Molecular testing and PD-L1 expression were performed according to the local procedure for each center. Exposure to air pollution was extrapolated from patients' home city using ZIP code.

Particulate matter 2.5, 10, NO2 and O3 exposure was based on the observational data and modulization. Data was expressed as annual coverage concentration weighted to pollution in microgram per meter cube with log of 3, 5, 10 and 20 years. Radon exposure was expressed as a geogenic radon potential according to IRSN and classified into low, intermediate and high.

These were the statistical consideration. Quantitative variable were expressed as a mean and SD in case of normal distribution. Then association between the exposure and outcome were assessed using logistic regression adjusted for age, sex, smoking status, histological subtype and stage. Log linearity assumption were verified. Effect size are expressed as a odds ratio with 95% confidence interval for one microgram per meter cube.

So this was the baseline characteristic median age was 67, 78% of the patients were male, 50% patients were active smokers and 35% patients were never smokers. Most common subtype was adenocarcinoma. Staging 63% patients were of stage 4 followed by stage 1, 2 in 22% of the patients. Out of 8, 999 patients

included 5778 patients with non squamous NSLC were included in the analysis. This is the molecular profile and PD-L1 expression. Out of the screen, 13% patient had EGFR mutation, 36% patient had KRAS mutation, 2.1% patient had ALK mutation, 5% patient had BRAF mutation.

STK11 was seen in 16% of the mutation. PD-L1 expression was more than 50% in 27% of the patient, 1 to 49 in 31% patient, and less than 1% in 42% patient. So exposure to PM2.5 was generally low, but variable. There was an association between PM2.5 with the presence of EGFR mutation in the newly diagnosed NSCLC.

Also, association between PM2.5 and EGFR mutation was more pronounced in male smokers and young patients. No major difference was there by the type of mutation. A similar association was found between PM10 and nitric oxide which are highly linked to PM2.5. Inverse association was found with O3 which is known to be inversely correlated with NO2 and PM2.5.

There was no association between exposure and KRAS mutations. There was no association was found between exposure to PM2.5 and other pollutants and other alterations including ALK, BRAF, MED. Radon potential exposure was also not associated with any driver oncogene mutation.

PD-L1 expression was not associated with any pollutant. STK11 mutations were associated with particulate matter taint but not with the other pollutants. So this was all summary. To conclude, this study confirmed the epidemiological association between exposure to PM2.5 and EGFR mutations after adjustment on confounding factors among patients with newly diagnosed non squamous cell lung carcinoma

or ratio for one microgram per metal cube increase 1.15 more pronounced in male smoker and younger patient there was no association between pollutants and keras mutation absence of association and other alteration that may be due to lack of power these results are incentive to pursue pollution reduction efforts worldwide to add both collective and individual levels

implementation of exposure to air pollution in screening strategy the impact of exposure to pollutants or response to treatment remains to be determined the second abstract is impact of ambient air pollution on cancer incidence and mortality

In 2020, cancer caused 19.3 million cases and 10 million deaths with 70% in low and middle income countries. Incidence rates varied globally, highest in Europe. In 2019, cancer represented 9.93 of global disability adjusted life years, second to cardiovascular disease. Nearly 44.4% of deaths are linked to modifiable lifestyle and environmental factors.

The aim of this study was to fill the gap by examining the association between exposure to major ambient air pollutants and the incidence and mortality of lung cancer and some other non-lung cancers. Study design, it was a systematic review and meta-analysis, othering to Cochrane collaboration and PRISMA guidelines. They included human studies,

major air pollutants that is PM 2.5, 10, NO2 and O3 and specific cancers like breast, liver, lung, pancreas, bladder. Case reports, missing outcome data, these were excluded. PubMed, MBase, these database were searched using keywords and data was extracted.

So, on subgroup analysis, it was found that there is an association between air pollutants and the cancer mortality, including all cancers. There was a significant association between all four air pollutants and the lung cancer mortality with relative risk 1.1. Significant association was observed between air pollutant and breast cancer mortality.

Also, the significant exposure was noted between PM2.5 exposure and liver cancer mortality. This study confirmed the association between air pollution exposure and lung cancer incidence and mortality. This result could contribute to community cancer prevention and diagnosis and help inform stakeholders and policymakers in decision making. Thank you.