

# THE POTENTIAL FOR LUNG CANCER DETECTION IN COVID CT SCANS WITH AI TECHNOLOGIES USAGE

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## Background

Lung cancer is a leading cause of cancer-related mortality both worldwide and locally in Russia. COVID-19 pandemic has made patients journey very difficult especially for diagnostics of new lung cancer (LC) cases because of lockdown, social distancing, similarity of symptoms and limitations with healthcare access. At the same time thousands patients were underwent CT for COVID detection. The aim of our study is to assess AI technology for LC detection in COVID CT scans database.

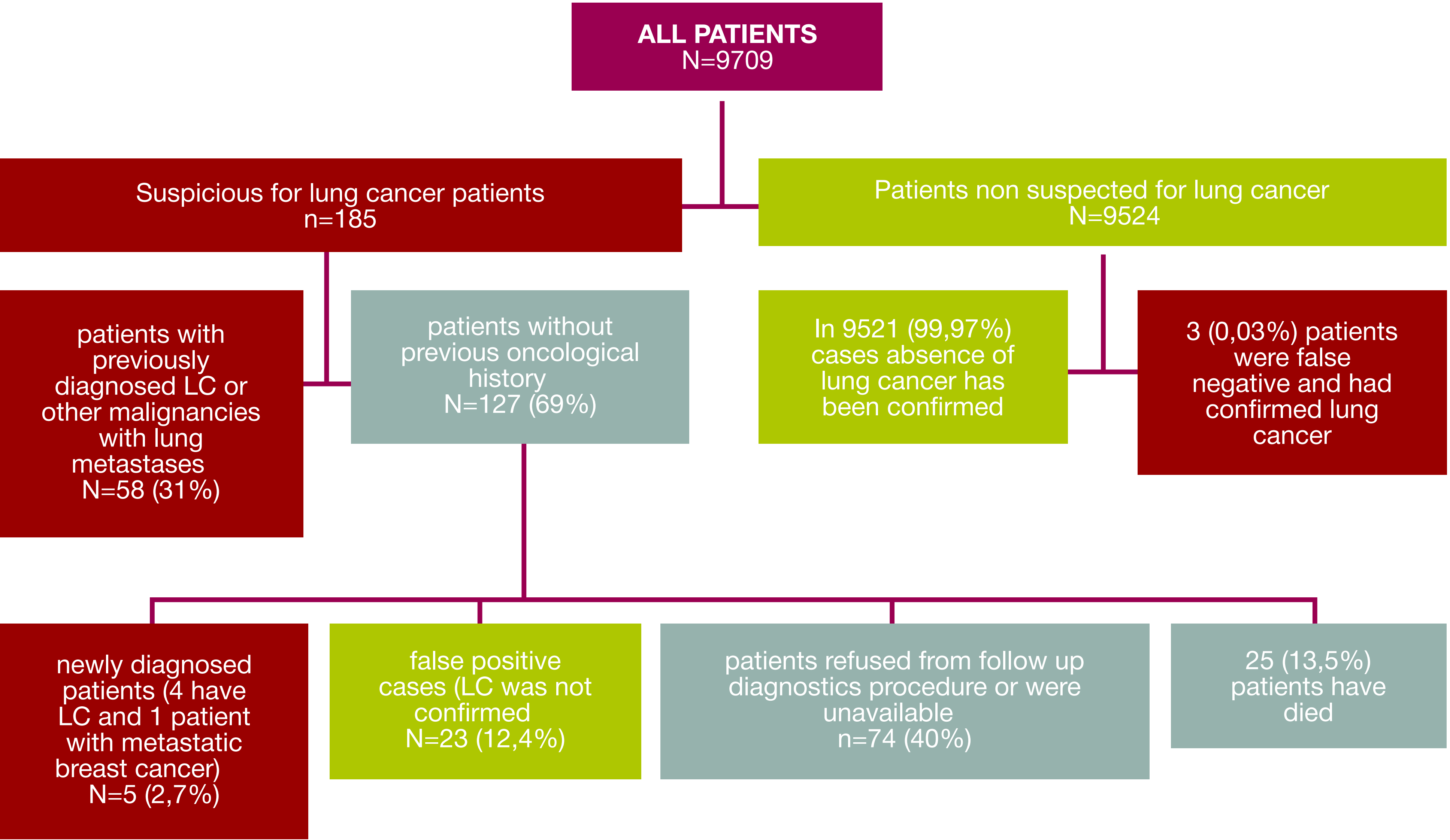
Figure 1  
**STUDY DESIGN**



## Methods:

Chest CT scans (without age, sex, smoking history, COVID severity grade and other limitations) were retrospectively anonymized and analyzed by AI platform (BotkinAI). All findings were classified according to Lung-Rads criteria, reassessed by experts, patients were checked with regional onco registry and if necessary follow up for LC confirmation.

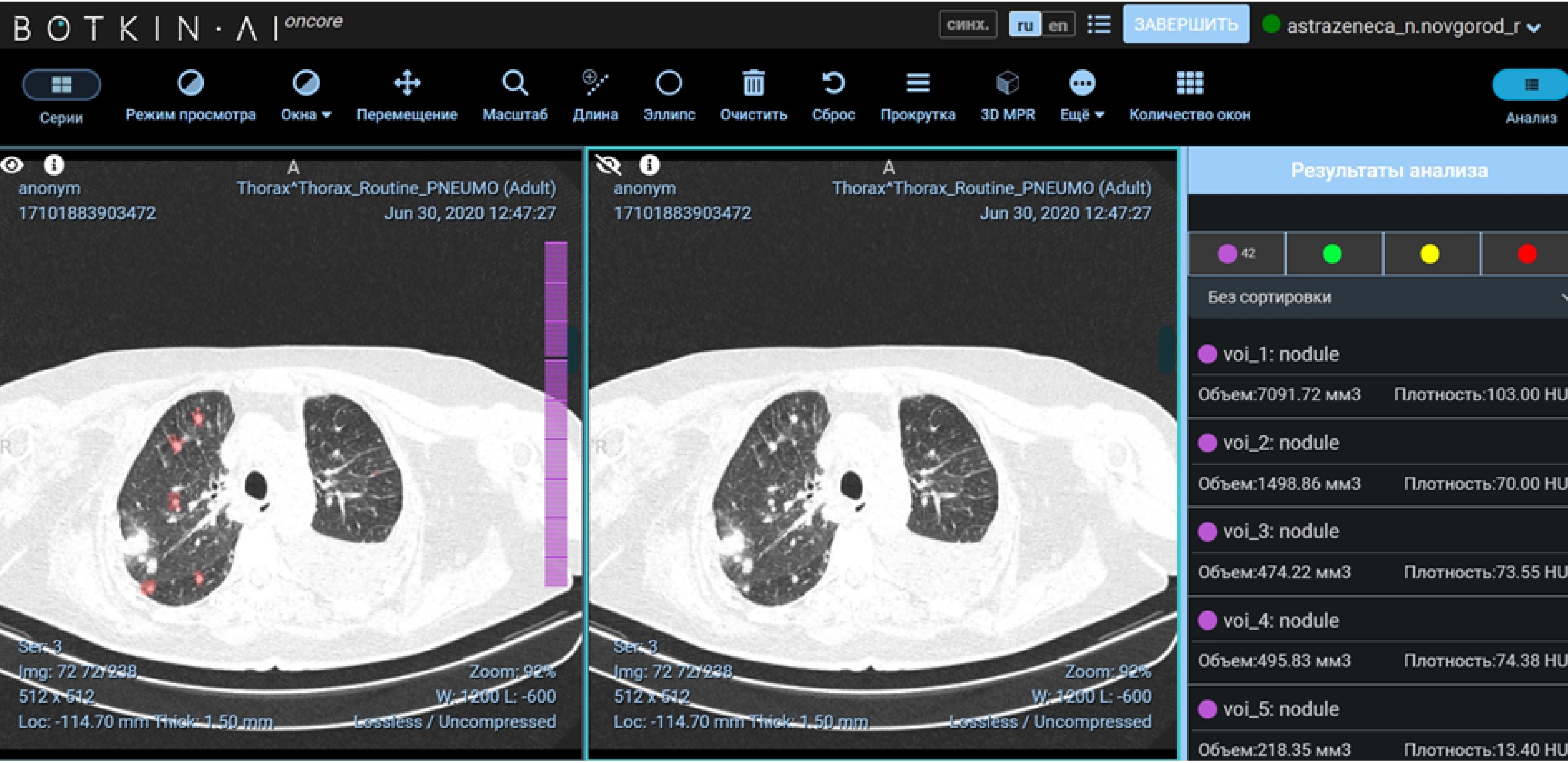
Figure 2  
**STUDY RESULTS**



## Results:

- CT scans from 9709 patients were analyzed: 9524 (98%) cases were Lung-Rads 0-2 and 185 (2%) were Lung-Rads 4+. Among Lung-Rads 4+ cases 58 (31%) patients had previously diagnosed LC or other malignancies with lung metastases, 5 (2,7%) pts were newly diagnosed (4 had LC and 1 metastatic breast cancer), 23 (12,4%) cases were false positive (LC was not confirmed), 74 (40%) patients refused from follow up diagnostics procedure or were unavailable, 25 (13,5%) pts has died and. Among 9524 Lung-Rads 0-2 cases 3 (0,03%) patients were false negative and had confirmed lung cancer.
- The sensitivity of AI was 95,4% (95% CI 87.29%-99.05%), specificity- 99,7% (95% CI 99.64% - 99.85%), concordance- 99,7% (95% CI 99.60% - 99.82%), PPV- 73,2% (95% CI 64.48% - 80.52%), NPV- 99,9% (95% CI 99.90% - 99.99%) respectively.

Figure 3  
**EXAMPLE OF AI PLATFORM VISUALIZATION**



## Conclusion:

Identifying LC at an early stage allows for potentially curative treatment, thereby improving survival. In absence of National LC screening program each chest CT scan must be assessed for LC. COVID-19 pandemic gave a unique chance for incidental pulmonary nodes detection and artificial intelligent technology can provide support physicians, save time and increase effectiveness of CT scans analysis. However in case of retrospective analysis of CT scans database there is a risk of patients lost. Some patients are resistant to conducting additional examinations in case of suspicious cases identified and some patients are died..We believe that implementation of incidental nodes assessment and LC screening programs and AI inclusion into routine practice can improve outcomes and increase survival of LC patients.

## Key words

Lung cancer, artificial intelligent, COVID, chest CT scans

## Disclosure of conflict of interest:

S. Gamayunov is a speaker for AstraZeneca, Roche, Novartis  
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