CKD national healthcare strategy

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CKD is one of the major causes of mortality and a significant source of healthcare costs, yet it still remains largely underdiagnosed and underestimated. This strategy aims to highlight some actionable points to decrease impact of CKD.

QUICK FACTS

- affects **1 in 10** people worldwide
- correlated with population **aging**, **diabetes** and **hypertension**
- significant comorbidity: CV mortality 8-10 times higher
- patients usually do not have any subjective problems at first
- often passed over by doctors

Epidemiology and Risk Factors

Out of almost 29,500 patients diagnosed in the **ICD10 group N18** in 2017, about 7,500 died within 4 years, 1,500 to 2,000 each year (Source: data of VšZP, a.s., Bratislava). This means the 20.9% risk of death within 4 years.

Machine Learning Model for Risk Scores

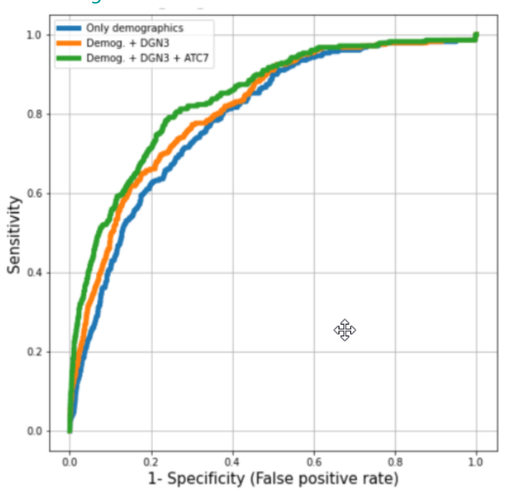
During the EHH 2021, a machine learning (ML) model for assessing patient CKD risk score has been developed, taking into account patient's medication history (obtained from healthcare claims) on top of the usual demographic and clinic markers such as age, sex, smoking and other chronic diseases (heart diseases, diabetes etc.). It turns out that medication history **significantly improves the prediction** of possibility of developing CKD. The final ROC AUC of the model is 0.87.

Model source data:

- 7 years of medical records (VšZP),
- Assessing risk of 2.6 mil patients not treated in nephrology so far.

ROC AUC curves of the ML models

according to the included covariates



Source: VšZP, a.s., Bratislava2017 – 2020.

Sankey diagram of progression of the health condition of the renal disease patients

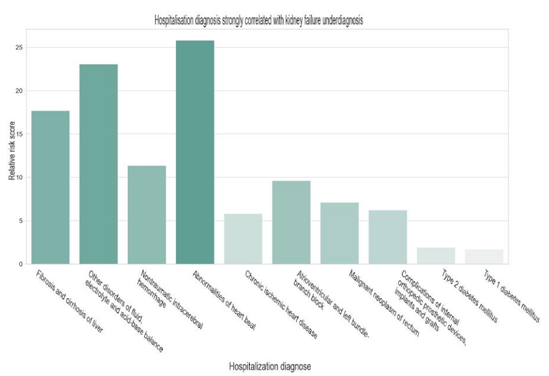
Source: VšZP, a.s., Bratislava2017 – 2020.

Recommendations for Health Insurance Companies (HIC)

- Create new bonus payment criterion as an incentive to healthcare providers to ensure that risk patients will have a blood test for CKD made as a part of the preventive health check in GP.
- **Withdraw the costs for the CKD blood test from the pool of monitored expenses** (to remove the incentive for the healthcare providers to cut costs by not providing the test)
- Ensure that **GPs are educated** about CKD
- Make use of the **ML model** to **select high risk** individuals
  - **contact them** (via email, app, phone, letter),
  - **contact their GPs** with lists of selected patients.

Recommendations for General Practitioners

- Test for CKD more frequently in patients with strongly correlated diagnoses (e.g. diabetes, heart diseases, high blood pressure).
- prevention in order to slow the progression of CKD
- Dietary Approaches to Stop Hypertension (DASH) diet
- regular blood and urine tests, high pressure checks
- vitamin D prescription
- discuss with patients other prescriptions to avoid taking large amounts of painkillers
- **Explain chronic kidney disease to patients**



Recommendations for Ministry of Health

- Make CKD blood tests and eGRF* recommended/mandatory in preventive check regulation for moderate risk groups (e.g. patients over 50 years of age with hypertension, diabetes, liver problems etc.)
- A list of drugs correlated with later underdiagnosed CKD has been created. Pharmacies could be giving away leaflets promoting CKD awareness

* Estimated glomerular filtration rate (see e.g. https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd/tests-diagnosis)

Sources

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