The Hilltop Institute

The Hilltop Pre-AH Model: Avoidable Hospitalizations
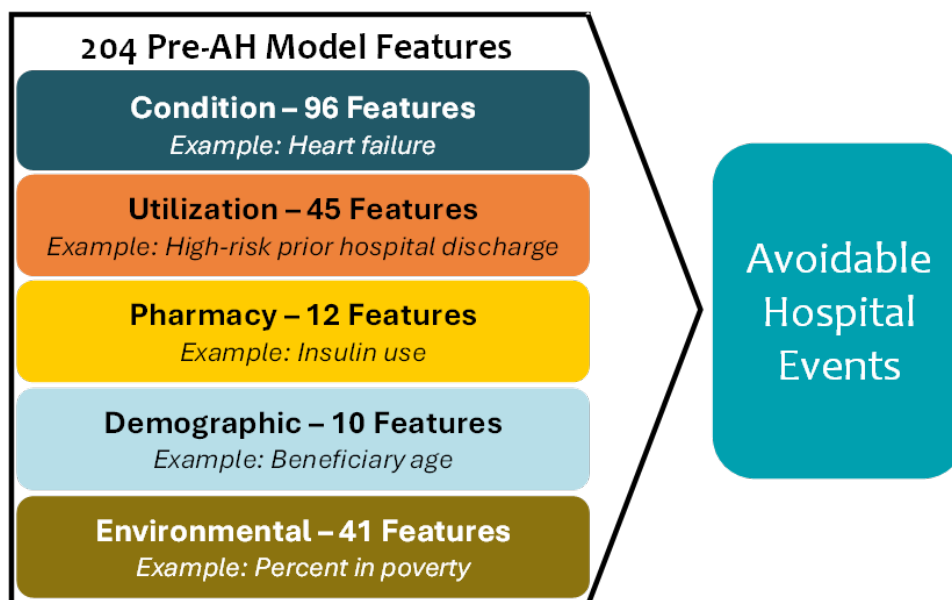
fact sheet

Purpose: The Hilltop Pre-AH Model—which generates the rankings for the Avoidable Hospitalizations (Pre-AH) scores—is designed to assist providers by allowing them to easily identify patients at a high risk of incurring an avoidable inpatient hospitalization or emergency department (ED) visit. The Pre-AH Model provides risk scores and reasons for risk for all attributed beneficiaries of Maryland Primary Care Program (MDPCP) practices every month to help care teams make informed decisions about how to direct scarce care coordination resources to the individuals who will benefit from them the most.

Outcome: The Hilltop Pre-AH Model predicts risk for an avoidable inpatient hospitalization or ED visit in the next month using a composite of 10 conditions (prevention quality indicators, or PQIs) determined to be potentially preventable with high-quality outpatient care by the Agency for Healthcare Research and Quality.

Risk Factors: The Hilltop Pre-AH Model includes 204 risk factors engineered specifically for this model that are categorized into five domains: Condition, Utilization, Pharmacy, Demographic, and Environmental. These risk factors were created using administrative claims data and publicly available data sources (e.g., the American Community Survey, Environmental Protection Agency). All features have been shown to predict avoidable hospital events in previously published work.

For more information on the tool, including a full list of risk factors, reference the documentation located in the "help" page of the MDPCP reporting suite or visit the MDPCP "practice information" webpage and click on "Prediction Tools."

204 Pre-AH Model Features

Condition – 96 Features
Example: Heart failure

Utilization – 45 Features
Example: High-risk prior hospital discharge

Pharmacy – 12 Features
Example: Insulin use

Demographic – 10 Features
Example: Beneficiary age

Environmental – 41 Features
Example: Percent in poverty

Avoidable Hospital Events

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The Hilltop Pre-DC Model: Severe Diabetes Complications

fact sheet

Purpose: The Hilltop Pre-DC Model—which generates the rankings for the Severe Diabetes Complications (Pre-DC) scores—is designed to facilitate the active management of type 2 diabetes by estimating individuals' risk of incurring inpatient admissions or emergency department (ED) visits for severe diabetes complications. The Pre-DC Model provides risk scores and reasons for risk for all attributed beneficiaries of Maryland Primary Care Program (MDPCP) practices every month to help care teams proactively identify high-risk individuals and allocate scarce care management resources.

Outcome: The Hilltop Pre-DC Model predicts risk for an inpatient hospitalization or ED visit due to severe complications of type 2 diabetes in the next month across six domains of complications: ophthalmic/retinopathy; nephropathy; cerebrovascular; cardiovascular; peripheral vascular; metabolic.

New Risk Factors: In addition to the 204 risk factors already included in the Hilltop Pre-AH Model, the Hilltop Pre-DC Model will include 18 new risk factors engineered specifically for this model. These risk factors were created using administrative claims data and have been shown to predict severe complications of type 2 diabetes in previously published work.

For more information on the tool, including a full list of risk factors, reference the documentation located in the "help" page of the MDPCP reporting suite or visit the MDPCP "practice information" webpage and click on "Prediction Tools."
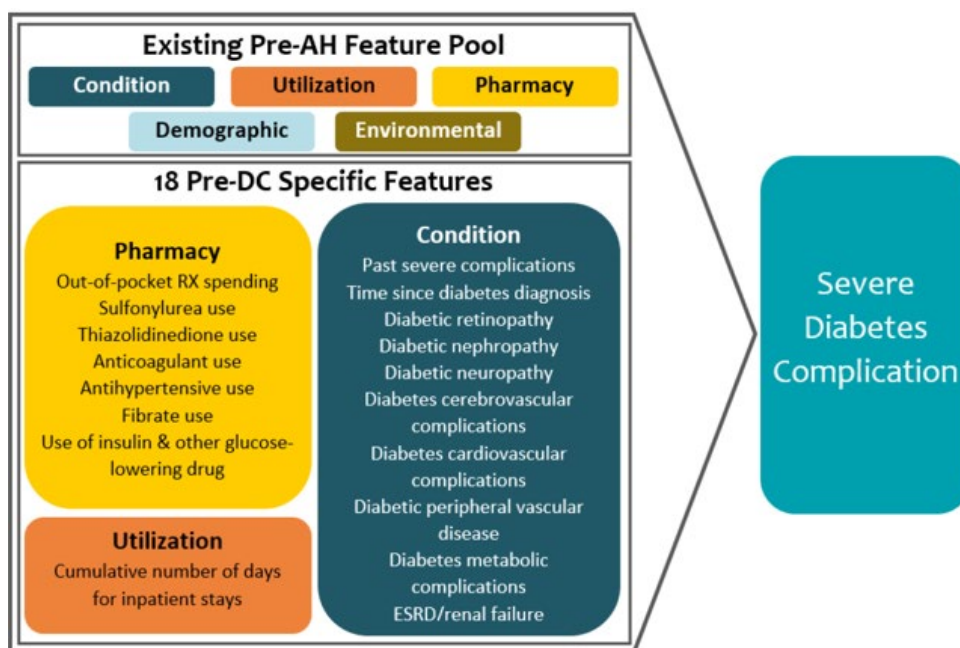

Existing Pre-AH Feature Pool
- Condition
- Utilization
- Pharmacy
- Demographic
- Environmental

18 Pre-DC Specific Features

Pharmacy
Out-of-pocket RX spending
Sulfonylurea use
Thiazolidinedione use
Anticoagulant use
Antihypertensive use
Fibrate use
Use of insulin & other glucose-lowering drug

Utilization
Cumulative number of days for inpatient stays

Condition
Past severe complications
Time since diabetes diagnosis
Diabetic retinopathy
Diabetic nephropathy
Diabetic neuropathy
Diabetes cerebrovascular complications
Diabetes cardiovascular complications
Diabetic peripheral vascular disease
Diabetes metabolic complications
ESRD/renal failure

Severe Diabetes Complication

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The Hilltop Pre-HE Model: Hospice Eligibility & Advanced Care Planning

fact sheet

Purpose: The Hilltop Pre-HE Model—which generates the rankings for the Hospice Eligibility and Advanced Care Planning (Pre-HE) scores—is designed to support proactive advanced care planning discussions by estimating a patient's risk of eligibility for hospice. The Pre-HE Model provides risk scores and reasons for risk for all attributed beneficiaries of Maryland Primary Care Program (MDPCP) practices every month in order to identify patients that are potentially appropriate for hospice care and to provide care teams with information that can guide the sensitive and difficult conversations about end-of-life care with patients and their families.

Outcome: The Hilltop Pre-HE Model predicts risk of eligibility for hospice.

New Risk Factors: In addition to the 204 risk factors already included in the Hilltop Pre-AH Model, the Hilltop Pre-HE Model will include 18 new risk factors engineered specifically for this model. These risk factors are created using administrative claims data and have been shown to predict mortality in previously published work.

For more information on the tool, including a full list of risk factors, reference the documentation located in the "help" page of the MDPCP reporting suite or visit the MDPCP "practice information" webpage and click on "Prediction Tools."

Existing Pre-AH Feature Pool
- Condition
- Utilization
- Pharmacy
- Demographic
- Environmental

18 Pre-HE Specific Features

Utilization
- Home oxygen equipment use
- Home hospital bed use
- Dialysis received
- Chemotherapy received

Pharmacy
- Morphine use

Condition
- Risk related to frailty
- Recent increase in frailty
- Paraplegia or hemiplegia
- Comorbid dementia & frailty
- Brain & nervous system cancer
- Bone & connective tissue cancer
- Ovarian cancer
- ESRD/Renal Failure
- Pancreatic cancer
- Liver cancer
- Esophageal cancer
- Stomach cancer
- Lung cancer

Hospice Eligibility

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