

**NB Chronic Obstructive
Pulmonary Disease Health
Information Platform
(NB-CHIP)
Vitalité
V02**

Codebook

Compiled by: NB-IRDT Staff

How to Obtain More Information

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About This Codebook

This reference guide is intended for users of the NB Chronic Obstructive Pulmonary Disease Health Information Platform (NB-CHIP) Vitalité V02 data set, provided by Vitalité Health Network (VHN). This guide provides an overview of the data, the general methodology used in its creation, and important technical information, such as table and field descriptions. The development of this document is an ongoing process and will receive updates when changes occur in the NB-CHIP Vitalité database.

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Overview

The New Brunswick COPD Health Information Platform (NB-CHIP) was developed collaboratively by the New Brunswick Institute for Research, Data and Training (NB-IRDT), the New Brunswick Department of Health, and the New Brunswick Regional Health Authorities (RHAs): Horizon Health Network and Vitalité Health Network. NB-CHIP data is laboratory data collected during regular care practice. In New Brunswick, pulmonary function testing, including spirometry, is primarily completed by a Registered Respiratory Therapist (RRT) following referral by a physician. The NB-CHIP data set contains pulmonary function data obtained from test results.

Sample Universe

Pulmonary function data, including spirometry tests, collected at VHN facilities in New Brunswick

Date Range

January 2007- December 2017

Data Source

Vitalité Health Network (VHN)

How to Cite this Codebook

New Brunswick Institute for Research, Data and Training. (2020). NB Chronic Obstructive Pulmonary Disease Health Information Platform (NB-CHIP) Vitalité V02 Codebook. Fredericton, NB: New Brunswick Institute for Research, Data and Training.

Acknowledgements

The NB-CHIP Vitalité V02 Database is used with the permission of Vitalité Health Network.

About this Product

Purpose of the Product

The purpose of the NB Chronic Obstructive Pulmonary Disease Health Information Platform (NB-CHIP) Vitalité V02 Codebook is to provide information on the linkable New Brunswick pulmonary function test data held at the New Brunswick Institute for Research, Data and Training (NB-IRDT). This data is accessible to researchers and is particularly relevant for research areas related to health and epidemiology.

Definitions and Concepts

Alveolar volume (VA)- the volume of fresh air entering the alveoli per minute.

Diffusing capacity of lung for carbon monoxide (DLCO) - DLCO measures the transfer of carbon monoxide from alveolar gas to hemoglobin in pulmonary capillary blood.

Expiratory reserve volume (ERV) - The extra volume of air that can be expired from the lungs with determined effort following a normal tidal volume expiration.

Forced (or Peak in Breeze) expiratory flow (FEF/PEF) - the rate of airflow recorded in measurements of forced vital capacity, usually calculated as an average flow over a given portion of the expiratory curve.

Forced exhaled volume in the first second (FEV1) - the volume of air (in liters) exhaled in the first second during forced exhalation after maximal inspiration

Forced expiratory time (FET) - the time taken for an individual to forcefully exhale through an open mouth from total lung capacity until airflow became inaudible.

Forced vital capacity - the maximum amount of air you can forcibly exhale from your lungs after fully inhaling.

Functional residual capacity (FRC) - the volume remaining in the lungs after a normal, passive exhalation.

Inspiratory Capacity (IC) - the maximum volume of air that can be inspired after reaching the end of a normal, quiet expiration.

Peak inspiratory flow (PIF) - the maximal flow achieved by an individual during an inspiratory maneuver.

Residual volume (RV) - the amount of air that remains in a person's lungs after fully exhaling.

Tidal volume (TV) - The amount of air you typically breathe into your lungs when at rest and not exerting yourself.

Total Lung Capacity (TLC) - the total volume of air in the lungs after a maximal inspiration.

Vital capacity (VC) - the greatest volume of air that can be expelled from the lungs after taking the deepest possible breath.

Content

This version of the NB-CHIP dataset contains 6 groups of data elements:

Group	Description
1	Demographic information
2	Physical characteristics
3	Clinical information
4	Smoking information
5	Test administration info
6	Pulmonary function test results

Each group includes the name, type (character or numeric), length, label, and count of non-missing values of the data elements.

General Methodology

Spirometry is a shortened version of a full pulmonary function test (PFT) that measures how much air a patient is able to fully inhale and fully exhale with maximum effort. In order for a patient to be referred for a PFT, they usually present to their primary care physician with complaints of a lingering cough, a cold that won't go away, etc. Lesser numbers of PFTs come from hospital in-patient referrals by respiratory therapists. Healthcare professionals may suggest PFTs if signs and symptoms lead them to suspect chronic lung conditions such as

- Asthma,
- COPD, or
- Pulmonary fibrosis.

When a patient receives the test date, they are asked to withhold from using all puffers for four hours prior to testing. They arrive at the testing site and are weighed and measured (used to calculate reference values) and are asked questions about smoking habits, medications, shortness of breath, cough, and other health indicators. The patient is then given instruction on how to perform the test. Some patients require much coaching to inhale maximally and forcefully exhale; PFTs are effort dependent and require skill in coaching the patient to obtain the best results.

Airflow rates and volumes are recorded prior to and following the administration of a bronchodilator to determine if the patient has any improvement in air flow rates due to the bronchodilator. Bronchodilators are used during PFTs because they open the airways (allowing for more airflow), and as such interpretations and diagnoses are always made based on these "post" (or after) values. Major differences in pre/post bronchodilator values are essential in the diagnostic process, allowing for differential diagnoses of obstructive (asthma, COPD) or restrictive (pneumonia) airflow limitations. Obstructive airflow limitations are partially reversible, and as such are sensitive to the application of bronchodilators. The degree of responsiveness to a bronchodilator, as described in the change between pre/post values, can also help (though not definitively) in differentiation between different obstructive disorders such as asthma and COPD.

PFTs are administered in labs throughout NB, and results are stored in specific systems (Breeze, VMax) locally. Staff from the RHAs coordinate the collation and comparability of the two distinct data sets. Upon arrival at NB-IRDT, the two data sets are combined by staff into a single file for storage on the NB-IRDT platform. NB-IRDT then stores the data securely for authorized access for researchers.

Limitations

The NB-CHIP Vitalité data set only contains the subset of New Brunswick patients treated at VHN facilities. As pulmonary function tests are usually performed at the request of healthcare providers, the data may be subject to selection or screening biases.

Comparison to Other Products/Versions

The NB Chronic Obstructive Pulmonary Disease Health Information Platform (NB-CHIP) Horizon (HH04) data set completes the NB-CHIP Vitalité data. Combining both data sets produces an exhaustive list of pulmonary function tests within New Brunswick during the indicated period.

Using with Other Products

The NB-CHIP Vitalité data may be linked with other data sets on the NB-IRDT secure platform using scrambled identifiers. The following are examples of linkages with similar or commonly requested data sets:

DH01C02 – CCDSS Chronic Obstructive Pulmonary Disease (COPD) Data – CCDSS data sets track chronic conditions using algorithmically defined flags for individuals over time. Combining the NB-CHIP and CCSDD COPD data may permit the longitudinal tracking of disease progression via changes in pulmonary function and COPD diagnoses.

DH05 – Discharge Abstract Data – The Discharge Abstract Database, like the NB-CHIP Vitalité data, records punctual events, although they relate to hospitalizations instead of pulmonary function tests. The Discharge Abstract Database contains codes for diagnoses and interventions, as well as information regarding attending healthcare providers. Linking these data sets may provide a more complete picture of an individual's healthcare needs and treatment.

DH08 – NB Physician Billing – The Physician Billing data set contains records of claims for services rendered by New Brunswick healthcare providers, including licensed practical nurses. It has variables regarding the type of services, the provider and their specialty, as well as referral information. Combining the Physician Billing and NB-CHIP Vitalité data may reveal details about the treatment paths of individuals with COPD, such as whether they were referred to a specialist before or after a pulmonary function test.

DH10 – Citizen Database – The Citizen Database is a longitudinal data set of individuals living in New Brunswick, based on their eligibility for provincial Medicare. Combining the Citizen Database with the NB-CHIP data may reveal insights about the mobility or gaps in coverage or treatment of patients receiving pulmonary function tests.

HH04 – NB-CHIP Horizon – The NB-CHIP data is reported separately for each health authority in New Brunswick. The NB-CHIP Horizon data is the complement of the NB-CHIP Vitalité data. Together, they form an exhaustive list of pulmonary function tests performed in the province.

Record Layouts and Data Descriptions

1. Demographic Information

Variable Name	Type	Length	Label	Mandatory/optional
Age	Num	8	Age	Derived from DOB
Birthdate	Num	8	Date of birth	M
Gender	Char	6	Gender at birth	M
Race	Char	21	Race	O

The type 'Num' refers to numeric values while 'Char' refers to both alphabetic and numeric characters.

Age

Patient's calculated age at time of PFT

Date of Birth

Patient's date of birth in the format DD/MM/YYYY

Gender at Birth

Gender at birth, not identified gender

Gender at birth is required, as size of chest affects the predicted values, and size of chest is dictated by genetics. Selected by therapist from list:

Code

Female

Male

Race

Patient's race/ethnicity

Code

Caucasian

Black

Asian

Hispanic

African-American

Hispanic-American

Blank

2. Physical Characteristics

Variable Name	Type	Length	Label	Mandatory/optional
Height	Num	8	Height	M
Weight	Num	8	Weight	M
BMI	Num	8	BMI	M (Derived)

The type 'Num' refers to numeric values while 'Char' refers to both alphabetic and numeric characters.

Height

Patient's height in centimeters. If the patient cannot stand, arm span is an accepted alternative, as it closely matches height.

Weight

Patient's weight in kilograms

BMI

Patient's body mass index, calculated from height and weight input

3. Clinical Information

Variable Name	Type	Length	Label	Mandatory/optional
Cough	Char	7	Cough	<input type="radio"/>
Diagnosis	Char	215	Diagnosis	<input type="radio"/>
DyspneaExercise	Char	7	Dyspnea Exercise	<input type="radio"/>
DyspneaRest	Char	7	Dyspnea Rest	<input type="radio"/>
Productive	Char	7	Productive	<input type="radio"/>
Medications1_3	Char	255	Medications 1-3	<input type="radio"/>
Medications4_5	Char	255	Medications 4-5	<input type="radio"/>

The type 'Num' refers to numeric values while 'Char' refers to both alphabetic and numeric characters.

Cough

Patient-reported cough

Code

Yes

No

Diagnosis

Free text

Therapist input. Some locations use physician-provided diagnosis, other locations use patient-reported reason for referral. May not accurately reflect true diagnosis.

Dyspnea Exercise

Shortness of breath with exertion, patient-reported

Code

Yes

No

Dyspnea Rest

Shortness of breath at rest, patient-reported

Code

Yes

No

Medications 1-3

Therapist entered from patient interview

Medications 4-5

Therapist entered from patient interview

Productive

Defines if the patient produces daily phlegm, patient-reported

Code

Yes

No

4. Patient reported smoking information

Variable Name	Type	Length	Label	Mandatory/optional
Cigarettes	Char	7	Cigarettes	<input type="radio"/>
Smoker	Char	7	Ever smoked	<input type="radio"/>
PackYrs	Num	8	Pack Years	<input type="radio"/>
Quit	Char	7	Quit	<input type="radio"/>
Stopped	Num	8	Years Quit	<input type="radio"/>

The type 'Num' refers to numeric values while 'Char' refers to both alphabetic and numeric characters.

Cigarettes

Does the patient smoke cigarettes specifically

Code

Yes

No

Ever Smoked

Has the patient ever smoked

Code

Yes

No

Pack Years

Standard way to quantify smoking. Product of years smoked and packs per day.

Quit

Has the patient quit smoking?

Code

Yes

No

Years Quit

Number of years the patient been tobacco free

5. Test Administration Information

Variable Name	Type	Length	Description	Mandatory/optional
Room	Char	21	Room	O
testdate	Num	8	Test date	M
fac	Num	8	Facility Code	M
fac_desc	Char	50	Facility Description	M

The type 'Num' refers to numeric values while 'Char' refers to both alphabetic and numeric characters.

Room

Location test was administered. Time is often used as an additional field for capturing data and often does not contain a location.

Test date

System stamped date

Facility Code & Description

The facility where test was administered

Facility Code	Facility Description
5	Hôpital régional de Campbellton
9	Hôpital régional d'Edmundston
39	Hôpital régional Chaleur
48	Centre hospitalier universitaire Dr-Georges-L.-Dumont

6. Spirometry Results Information

Variable Name	Type	Length	Description	Mandatory/optional
_2575_perchg	Num	8	PEF 25-75% (% change)	M
_2575Post	Num	8	PEF 25-75% (ref)	M
_2575Post_per	Num	8	PEF 25-75% (post % ref)	M
_2575Pre	Num	8	PEF 25-75% (pre)	M
_2575Pre_per	Num	8	PEF 25-75% (post)	M
_2575Ref	Num	8	PEF 25-75% (% ref)	M
DLCO	Num	8	DLCO	O
DLCO_perRef	Num	8	DLCO (% ref)	O
DLCO_VA	Num	8	DLCO/VA	O
DLCO_VA_perRef	Num	8	DLCO/VA (% ref)	O
DLCO_VARef	Num	8	DLCO/VA (REF)	O

DLCORef	Num	8	DLCO (ref)	O
ERV	Num	8	ERV	O
ERV_perRef	Num	8	ERV (% ref)	O
ERVRef	Num	8	ERV (ref)	O
FET100_perchg	Num	8	FET100% (% change)	M
FET100_perPost	Num	8	FET100% (post % ref)	M
FET100_perPre	Num	8	FET100% (% ref)	M
FEV1_FVC_perchg	Num	8	FEV1/FVC (% change)	O
FEV1_FVCPost	Num	8	FEV1/FVC (post)	O
FEV1_FVCPost_per	Num	8	FEV1/FVC (post % ref)	O
FEV1_FVCPre	Num	8	FEV1/FVC (pre)	M
FEV1_FVCPre_per	Num	8	FEV1/FVC (ref)	M
FEV1_FVCRef	Num	8	FEV1/FVC (% ref)	M
FEV1_perchg	Num	8	FEV1 (% change)	O
FEV1_perRef	Num	8	FEV1 (% ref)	M
FEV1Post	Num	8	FEV1 (post)	O
FEV1Post_per	Num	8	FEV1 (post % ref)	O
FEV1Pre	Num	8	FEV1 (pre)	M
FEV1Ref	Num	8	FEV1 (ref)	M
FRC	Num	8	FRC	O
FRC_perRef	Num	8	FRC (% ref)	O
FRCRef	Num	8	FRC (ref)	O
FVC_perChg	Num	8	FVC (% change)	M
FVCPost	Num	8	FVC (post)	M
FVCPost_per	Num	8	FVC (post % ref)	M
FVCPre	Num	8	FVC (pre)	M
FVCPre_per	Num	8	FVC (% ref)	M
FVCRef	Num	8	FVC (ref)	M
IC	Num	8	IC	O
IC_perRef	Num	8	IC (% ref)	O
ICRef	Num	8	IC (ref)	O
PEF_perchg	Num	8	PEF (% change)	M
PEFPost	Num	8	PEF (Post)	M
PEFPost_per	Num	8	PEF (post % ref)	M
PEFPre	Num	8	PEF (Pre)	M
PEFPre_per	Num	8	PEF (% ref)	M
PEFRef	Num	8	PEF (Ref)	M
PIFPost	Num	8	PIF (Post)	M
PIFPre	Num	8	PIF (Pre)	M
RV	Num	8	RV	O

RV_perRef	Num	8	RV (% ref)	○
RV_TLC	Num	8	RV/TLC	○
RV_TLC_perRef	Num	8	RV/TLC (% ref)	○
RV_TLCRef	Num	8	RV/TLC (Ref)	○
RVRef	Num	8	RV (Ref)	○
TLC	Num	8	TLC	○
TLC_perRef	Num	8	TLC (% ref)	○
TLCRef	Num	8	TLC (Ref)	○
VA	Num	8	VA	○
VA_perRef	Num	8	VA (% ref)	○
VARef	Num	8	VA (REF)	○
VC	Num	8	VC (SVC)	○
VC_perRef	Num	8	VC (% ref)	○
VCRef	Num	8	VC (REF)	○

Pre: measured value. Observed values generated from the initial PFT which occurs prior to the application of a bronchodilator

Post: measured value. Observed values generated from the second PFT, which occurs following the application of a bronchodilator

Ref: System stored values. Predicted values based off of age, sex, race, and BMI

Pre_per: System generated value (Pre value/ Ref value)*100. Describes the difference between the pre value and reference value.

Post_per: System generated value (Post value/ Ref value)*100. Describes the difference between the pre value and reference value.

perRef: System generated value (Pre value/ Ref value)*100. Describes the difference between the pre value and reference value. (Same as Pre_per, but for measured variables where no bronchodilator is applied)

perChg: System generated value. Describes the percent change between pre and post values.

perRef= System generated value (value/ reference value)*100. Describes the difference between measured value and expected value

The type 'Num' refers to numeric values while 'Char' refers to both alphabetic and numeric characters.

_25-75% (FEF/PEF)

Forced (or Peak in Breeze) expiratory flow over the middle ½ of the FVC, measured in liters/second

DLCO (Diffusing capacity of lung for carbon monoxide: Pre, ref, %ref)

Absolute diffusion capacity independent of actual lung volumes

DLCO_VA (diffusion capacity/ alveolar volume)

Ratio of diffusion capacity with respect to alveolar volume

ERV (Pre, ref, %ref)

Expiratory reserve volume, measured in liters

FET100%

Forced expiratory time (length of time to fully exhale), measured in seconds

FEV1 (Pre, ref, %ref, post, %post ref, % change)

Forced exhaled volume in the first second, measured in liters

FVC (Pre, ref, %ref, post, %post ref, % change)

Forced vital capacity, measured in liters

FEV1/TLC (Pre, ref, %ref, post, %post ref, % change)

Forced exhaled volume in the first second divided by total lung capacity.

FRC (Pre, ref, %ref)

Functional residual capacity, measured in liters

IC (Pre, ref, %ref)

Inspiratory capacity, measured in liters

PEF [referred to as FEF in Breeze] (Pre, ref, %ref, post, %post ref, % change, 25-75%)

Peak expiratory flow, measured in liters/second

PIF (Pre, Post)

Peak inspiratory flow, measured in liters/second

RV (Pre, ref, %ref)

Residual volume, measured in liters

RV/TLC (Pre, ref, %ref)

Residual volume as a percentage of the total lung capacity

TLC (Pre, ref, %ref)

Total lung capacity, measured in liters.

VA (Pre, ref, %ref)

Alveolar volume measured in liters

VC (SVC) (Pre, ref, %ref)

Vital capacity (taken from slow vital capacity during testing), measured in liters.

Document History

Version	Author	Nature of Change	Date
1.0	Kyle Rogers & Keri Clark	Creation of Document	12-05-2020
1.1	Meg Pike	Final review before posting	08-04-2022