Data Manager Training Session 5

- National Report Analysis Overview
- Process / Outcome Measures
- STAR Ratings

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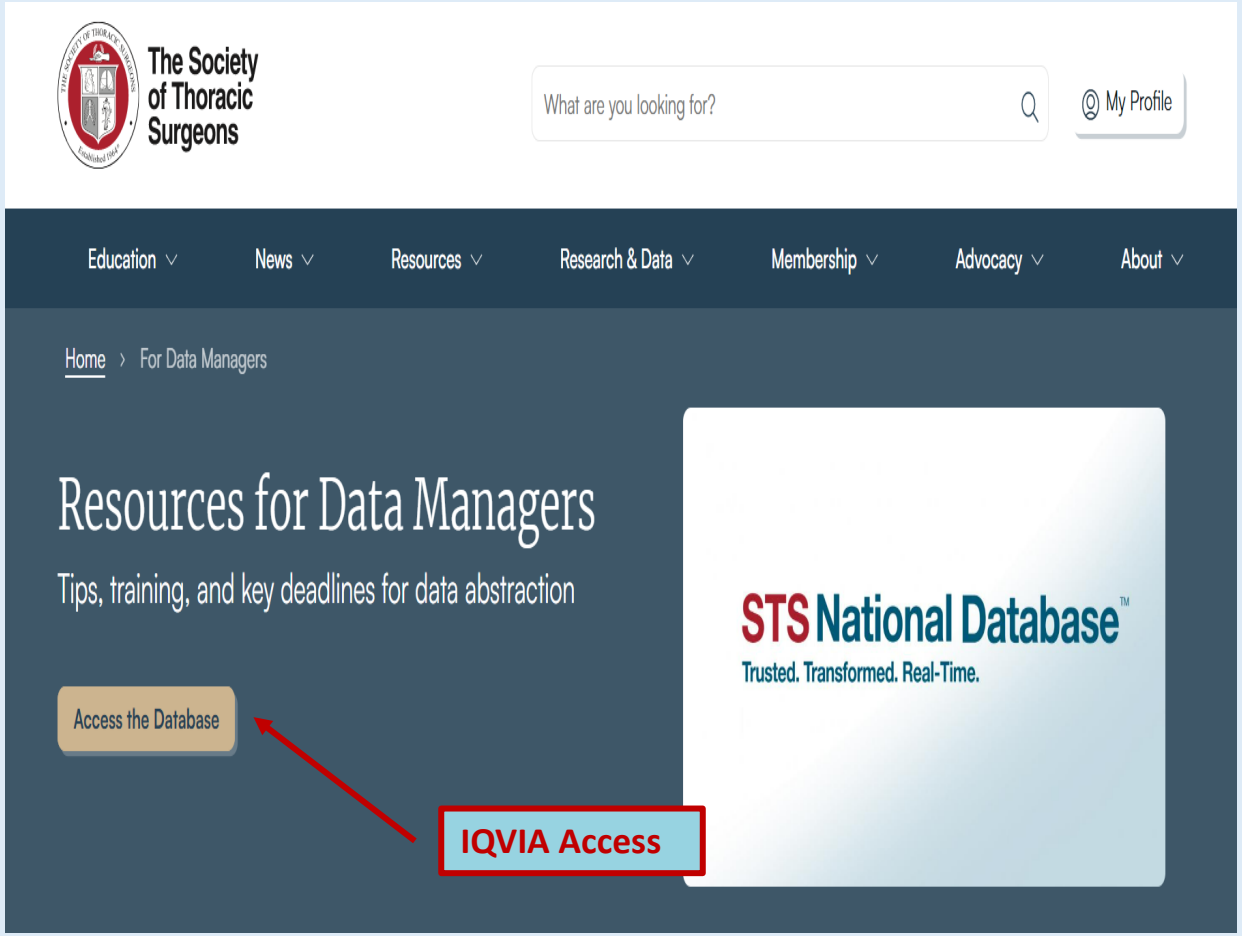
Learning Objectives

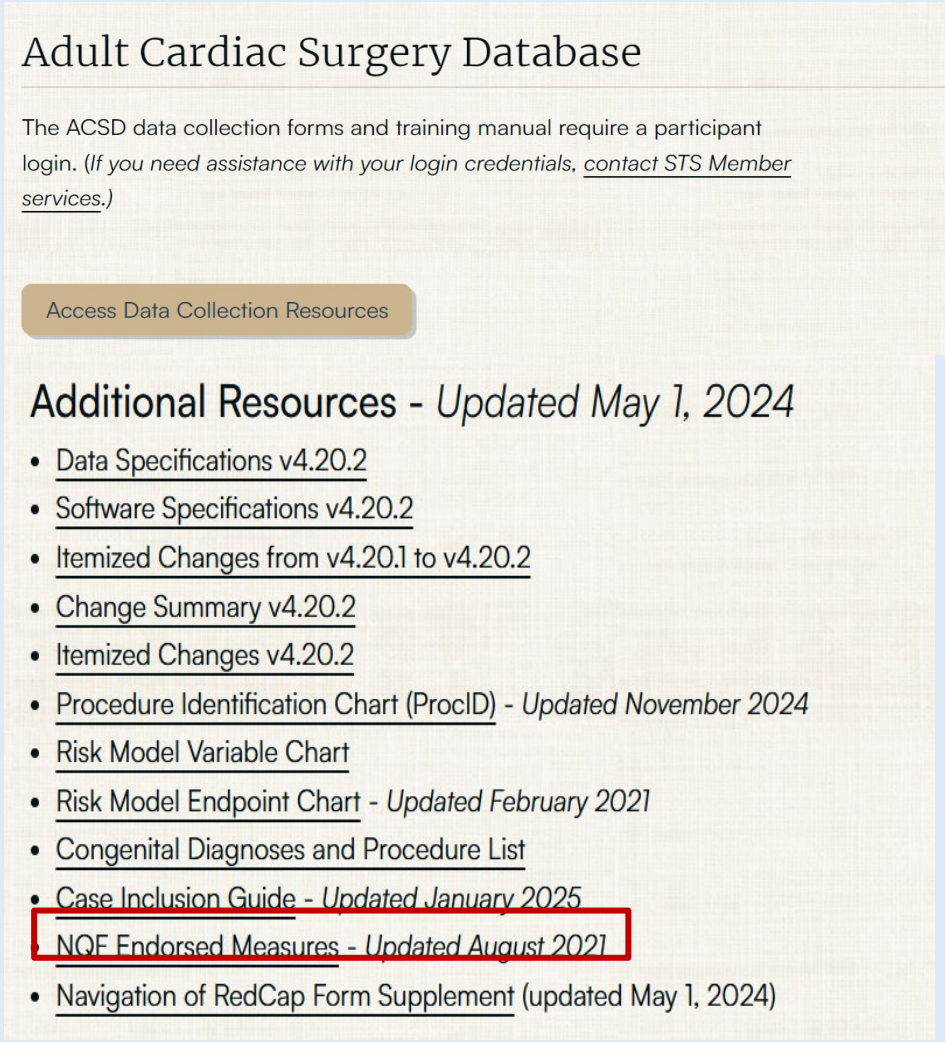
Upon completion of this session, participant will be able to:

- **Identify the resources available in the National Report Analysis Overview**
- **Understand the Process and Outcome Measures**
- **Know how STAR Ratings are derived**

STS National Database Website

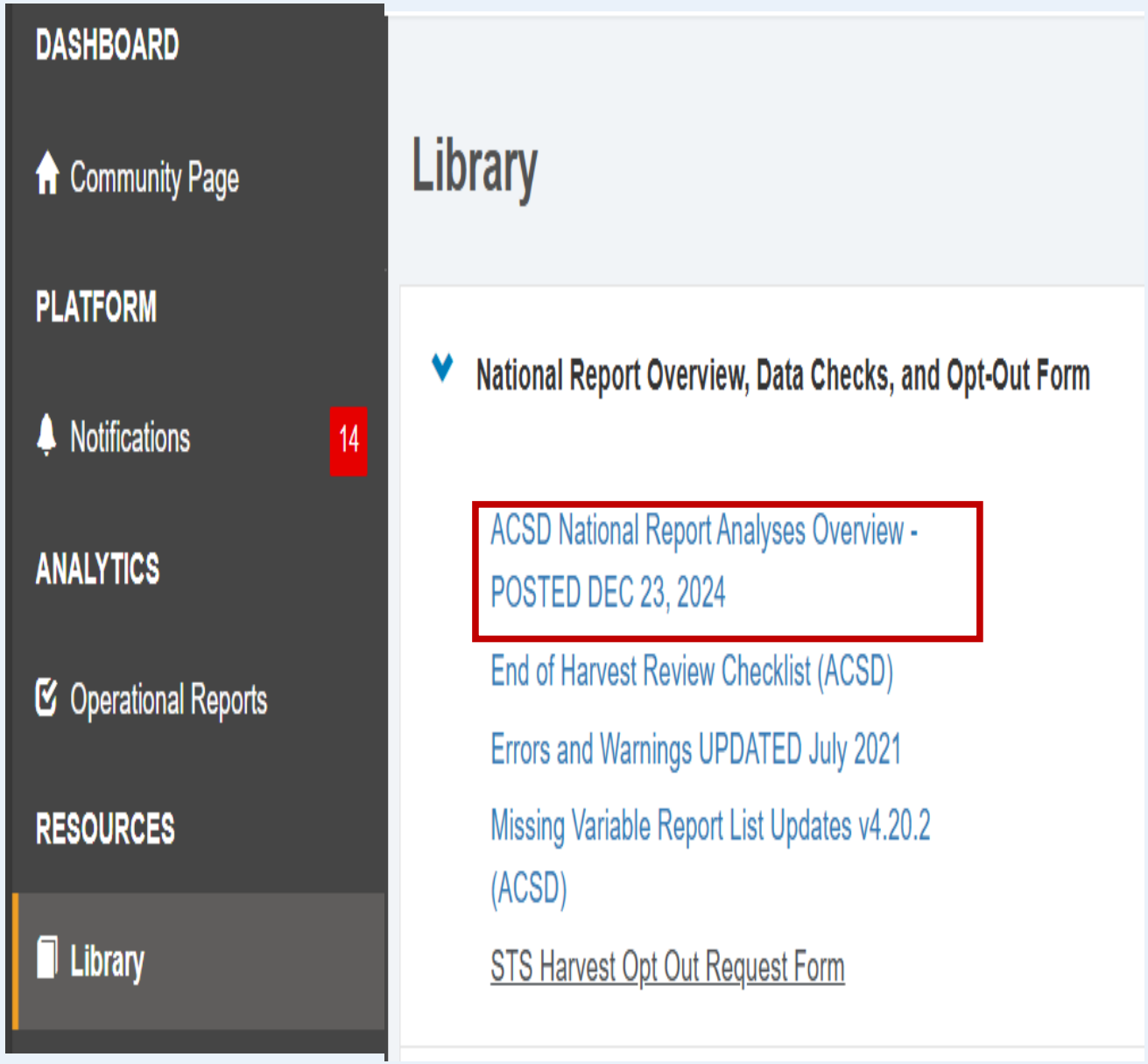


To find the National Report Overview – Enter IQVIA



To find the Process and Outcome Measures

Once you are in IQVIA select the ‘Library’ to find the National Report



ACSD National Report Analysis Overview

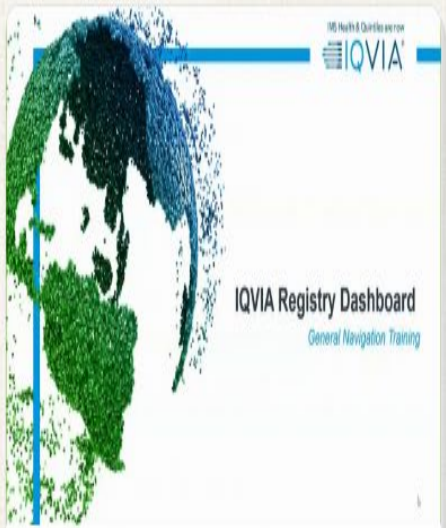
This report includes:

- The structure and content of the quarterly reports
- Risk adjusted and quality ratings methodology
- Instructions on how participants can utilize STS risk-adjustment locally
- An explanation of the STS Quality Ratings
- The interpretation Process and Outcomes Measures

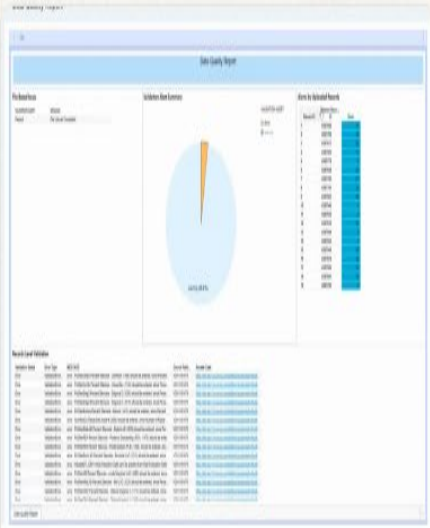
These videos are on the STS Website under ‘For Data Manager’ Tab

How-To Videos

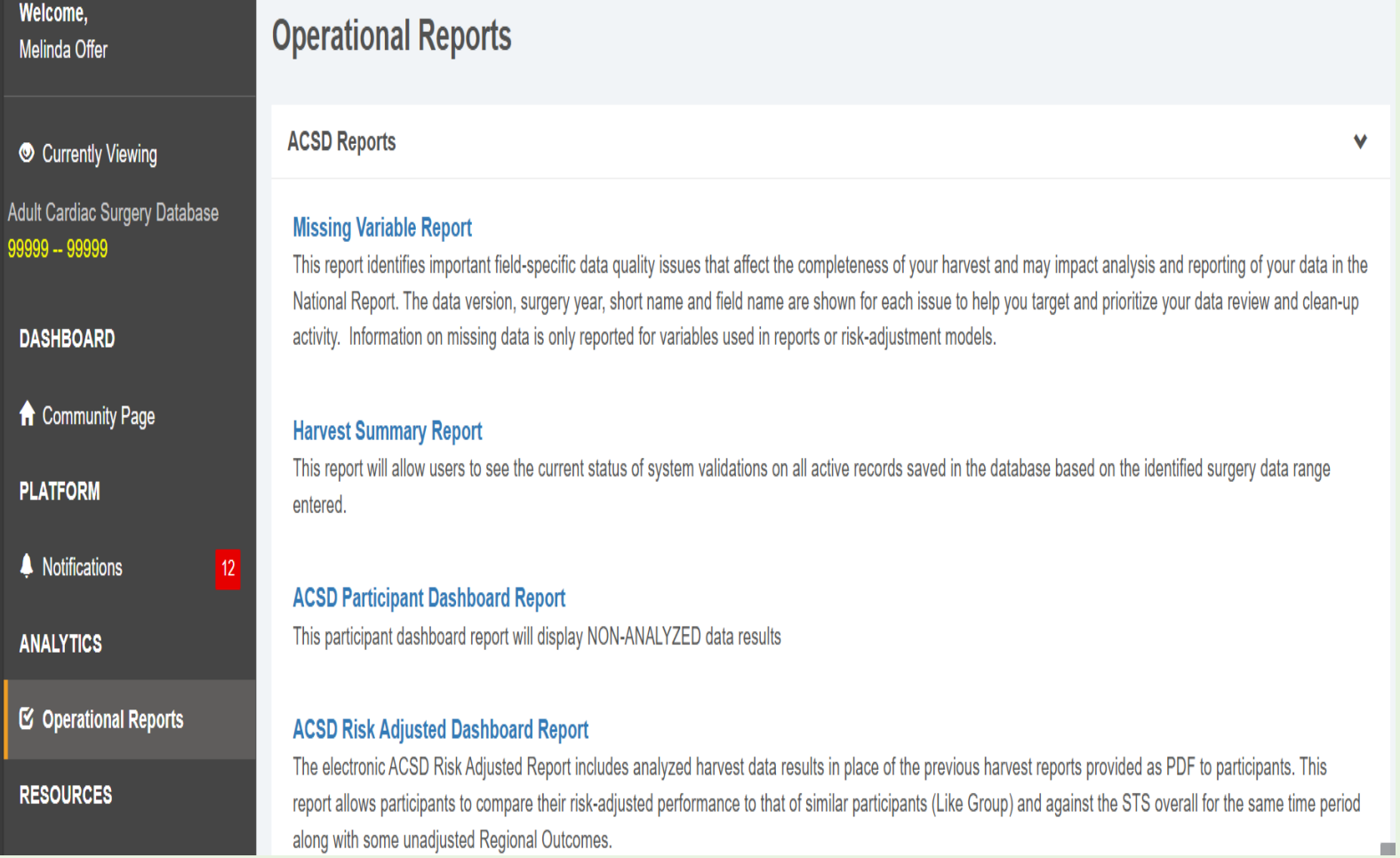
ACSD Risk Adjusted Dashboard Report



IQVIA Registry Dashboard - General Navigation Training



IQVIA Uploader and DQR Review



ACSD Risk Adjusted Dashboard Report

- The electronic ACSD Risk Adjusted Report includes analyzed harvest data results in place of the previous harvest reports provided as PDF to participants.

- This report allows participants to compare their risk-adjusted performance to that of similar participants (Like Group) and against the STS overall for the same time period along with some unadjusted Regional Outcomes.

Data Analyses of The Society of Thoracic Surgeons

Participant: 99999

STS Period Ending Sep 2024

Quality Ratings	Quality Rating Details	Rating Trends	Process and Outcome Measures
CABG	CABG	Rating Trends	CABG Process Measures
AVR	AVR		CABG Outcome Measures
AVR + CABG	AVR + CABG		All Cardiac Surgeries Process Measures
MVRR	MVRR		Mortality Outcome Measures
MVRR + CABG	MVRR + CABG		

Risk Adjusted and Regional Outcomes	Benchmark Reports	Anesthesia Report
Isolated CABG	Isolated CABG	Anesthesia - CABG Procedures
Isolated CABG - Subset: On Pump Procedures	Isolated CABG - Subset: On Pump Procedures	Anesthesia - Valve Procedures
Isolated CABG - Subset: Off Pump Procedures	Isolated CABG - Subset: Off Pump Procedures	
Isolated CABG - Subset: First Operations	Isolated CABG - Subset: First Operations	
Isolated CABG - Subset: Reoperations	Isolated CABG - Subset: Reoperations	
Isolated Aortic Valve Replacement	Isolated Aortic Valve Replacement	
Isolated Aortic Valve Replacement + CABG	Isolated Aortic Valve Replacement + CABG	
Isolated Mitral Valve Replacement	Isolated Mitral Valve Replacement	
Isolated Mitral Valve Replacement + CABG	Isolated Mitral Valve Replacement + CABG	
Isolated Mitral Valve Repair	Isolated Mitral Valve Repair	
Isolated Mitral Valve Repair + CABG	Isolated Mitral Valve Repair + CABG	
Multivalve	Multivalve	
MultiValve + CABG	MultiValve + CABG	
All		

[Main Display for ACSD Risk Adjusted Dashboard Report]

Quality Ratings, Quality Ratings Detail, and Rating Trends Section:

- **Quality Ratings: This section contains the Participants Star Ratings**
- **Quality Ratings Detail: This section contains granular detail used to determine the Participants' Star Ratings**
  - **Drill-down function to case-level data is available in this section of the report**
- **Rating Trends: This section contains the participants' Star Ratings over time.**

Data Analyses of The Society of Thoracic Surgeons

Participant: 99999

STS Period Ending Sep 2024

Quality Ratings	Quality Rating Details	Rating Trends	Process and Outcome Measures
CABG	CABG	Rating Trends	CABG Process Measures
AVR	AVR		CABG Outcome Measures
AVR + CABG	AVR + CABG		All Cardiac Surgeries Process Measures
MVRR	MVRR		Mortality Outcome Measures
MVRR + CABG	MVRR + CABG		

Domain	Rating	Participant		STS				
		Score	95% CI	Score	Min - Max	10th	50th	90th
Overall	★★★	**98.23%**	(97.86-98.55)	**96.97%**	(90.30-99.18)	95.49%	97.17%	98.22%
Absence of Mortality	★★★	**98.36%**	(97.81-98.81)	**97.57%**	(91.41-99.39)	96.25%	97.76%	98.66%
Absence of Morbidity	★★★	**94.83%**	(93.83-95.74)	**90.64%**	(75.81-96.84)	86.70%	91.11%	94.04%
Use of IMA	★★★	**99.77%**	(99.55-99.91)	**99.54%**	(88.21-99.99)	99.02%	99.76%	99.95%
Medications	★★	**94.81%**	(93.92-95.66)	**95.45%**	(25.75-99.98)	89.72%	97.87%	99.68%

★ Worse than Expected. Participant's performance is significantly worse than expected for their specific case-mix.

★★ As Expected. Participant's performance is not statistically different than expected for their specific case-mix.

★★★ Better than Expected. Participant's performance is significantly better than expected for their specific case-mix.

Note: Each participant's composite score and star rating are an estimate of their performance for their specific case-mix (e.g., patient acuity and severity) compared with overall, national STS outcomes for a similar mix of patients. Because a participant's composite score and star rating apply only to their case-mix, they cannot be directly compared with the composite score and star rating of another participant with a different case-mix.

Quality Ratings

- **This section contains the Participants Star Ratings.**

Quality Ratings Detail

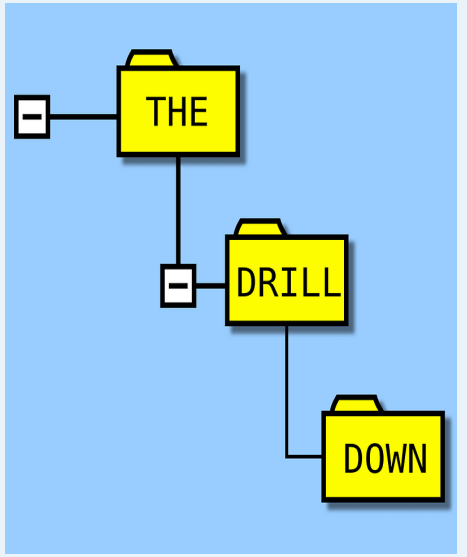
- **This section contains granular detail used to determine the Participants' Star Ratings. Drill-down function to case-level data is available in this section of the report.**

The Society of Thoracic Surgeons

STS CABG Composite Quality Rating
Participant: 99999
STS Period Ending Jun 2024

Star Ratings are only calculated for Harvest 1 and Harvest 3.

Quality Domain	Time Period	Eligible Procedures	Detail	*Count	Percent of Morbidity/Failure
Absence of Mortality	Jul 2021 - Jun 2024	1747	Mortality	26	
Absence of Morbidity	Jul 2021 - Jun 2024	1747	Any Morbidity	84	
			Cerebrovascular Accident only	6	7.1 %
			Deep Sternal Infection / Mediastinitis Only	1	1.2 %
			Multiple Morbidities	22	26.2 %
			Prolonged Ventilation Only	25	29.8 %
			Renal Failure Only	6	7.1 %
			Reoperation Only	24	28.6 %
Use of IMA	Jul 2021 - Jun 2024	1731	IMA Failures	4	
Medications	Jul 2021 - Jun 2024	1747	Failed to Prescribe All Eligible NQF Endorsed Medications	119	
			Failed to Prescribe Multiple Medications	7	5.9 %
			Only Failed to Prescribe Discharge Anti-Lipids	13	10.9 %
			Only Failed to Prescribe Discharge Anti-Platelets	2	1.7 %
			Only Failed to Prescribe Discharge Beta Blockade	13	10.9 %
			Only Failed to Prescribe Preoperative Beta Blockade	84	70.6 %



Rating Trends:

- This section contains the participants' Star Ratings over time.

Domain	Jul 2021-Jun 2024	Jan 2021-Dec 2023	Jul 2020-Jun 2023	Jan 2020-Dec 2022	Jul 2019-Jun 2022	Jan 2019-Dec 2021
Overall	★★★	★★★	★★★	★★★	★★★	★★★
Absence of Mortality	★★★	★★★	★★★	★★★	★★★	★★★
Absence of Morbidity	★★★	★★★	★★★	★★★	★★★	★★★
Use of IMA	★★★	★★	★★	★★	★★	★★★
Medications	★★	★	★	★	★	★★

Quality Ratings

Column 1. Domain - The quality domain for which results are provided

Domain	Rating	Participant		STS				
		Score	95% CI	Score	Min - Max	10th	50th	90th
Overall	★★★	98.23%	(97.86-98.55)	96.97%	(90.30-99.18)	95.49%	97.17%	98.22%
Absence of Mortality	★★★	98.36%	(97.81-98.81)	97.57%	(91.41-99.39)	96.25%	97.76%	98.66%
Absence of Morbidity	★★★	94.83%	(93.83-95.74)	90.64%	(75.81-96.84)	86.70%	91.11%	94.04%
Use of IMA	★★★	99.77%	(99.55-99.91)	99.54%	(88.21-99.99)	99.02%	99.76%	99.95%
Medications	★★	94.81%	(93.92-95.66)	95.45%	(25.75-99.98)	89.72%	97.87%	99.68%

The STS Composite Quality Score and Participant Rating System measures surgical performance based on a combination of 11 CABG Process and Outcomes Quality Measures. To assess overall quality, the 11 quality measures were grouped into four domains.

- **Domain 1. Absence of Operative Mortality**
- **Domain 2. Absence of Major Morbidity**
- **Domain 3. Use of Internal Mammary Artery (IMA)**
- **Domain 4. Use of All Evidence-based Perioperative Medications**

***For two of the domains (mortality; IMA usage), the study endpoint corresponds to a single measure.**

***For the other two domains (morbidity; medications), the study endpoint was defined in a manner that combines multiple measures. For these two domains, the study endpoint is a composite endpoint**

***The formula for the CABG composite score is:**

CABG Composite Score = 0.81×scoremort + 0.10×scoremorb + 0.07×scoreIMA + 0.03×scoremeds

Report Overview

STS NQF-endorsed Measures

Title	Description	Numerator	Denominator	Exclusions
Risk-Adjusted Operative Mortality for CABG	Percent of patients aged 18 years and older undergoing isolated CABG who die, including both 1) all deaths occurring during the hospitalization in which the CABG was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure	Number of patients undergoing isolated CABG who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure Number of isolated CABG procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Mortality Discharge Status (MtDCStat is Dead in version 2,81 or DischMortStat is Died in Hospital in version 2.9) Version 4.20.2 Number of isolated CABG procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Patient Expired in the OR (ExpiredInOR), Discharge status (DischMortStat) is Discharged to Hospice OR Died in Hospital	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	
Risk-Adjusted Operative Mortality for Aortic Valve Replacement (AVR)	Percent of patients undergoing AVR who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure	Number of patients undergoing AVR who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure Number of isolated AVR procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), (MtDCStat is Dead in version 2,81 or DischMortStat is Died in Hospital in version 2.9) Version 4.20.2 Number of isolated AVR procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative	All patients undergoing isolated AVR surgery according to STS Procedure Identification algorithm	

Domain 1. Absence of Operative Mortality
Proportion of patients (risk-adjusted) who do not experience operative mortality.

Operative mortality:

- **All deaths, regardless of cause, occurring during the hospitalization in which the operation was performed, even if after 30 days (including patients transferred to other acute care facilities)**

- **All deaths, regardless of cause, occurring after discharge from the hospital, but before the end of the thirtieth postoperative day**

- **All patients discharged to Hospice**

Report Overview
STS NQF-endorsed Measures

Risk-Adjusted Operative Mortality for Mitral Valve (MV) Replacement	Percent of patients undergoing MV Replacement who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure	Number of patients undergoing MV Replacement who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure Number of isolated MV Replacement procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), (MtDCStat is Dead in version 2,81 or DischMortStat is Died in Hospital in version 2.9) Version 4.20.2 Number of isolated MV Replacement procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Patient Expired in the OR (ExpiredInOR), Discharge status (DischMortStat) is Discharged to Hospice OR Died in Hospital	All patients undergoing isolated MV Replacement surgery according to STS Procedure Identification algorithm	
Risk-Adjusted Operative Mortality for Mitral Valve (MV) Repair	Percent of patients undergoing MV Repair who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure	Number of patients undergoing MV Repair who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure Number of isolated MV Repair procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), (MtDCStat is Dead in version 2,81 or DischMortStat is Died in Hospital in version 2.9) Version 4.20.2 Number of isolated MV Repair procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Patient Expired in the OR (ExpiredInOR), Discharge status (DischMortStat) is Discharged to Hospice OR Died in Hospital	All patients undergoing isolated MV Repair surgery according to STS Procedure Identification algorithm	

Domain 1. Absence of Operative Mortality
Proportion of patients (risk-adjusted) who do not experience operative mortality.

Operative mortality:

- **All deaths, regardless of cause, occurring during the hospitalization in which the operation was performed, even if after 30 days (including patients transferred to other acute care facilities)**

- **All deaths, regardless of cause, occurring after discharge from the hospital, but before the end of the thirtieth postoperative day**

- **All patients discharged to Hospice**

Report Overview STS NQF-endorsed Measures				
Risk-Adjusted Operative Mortality for MV Replacement + CABG Surgery	Percent of patients undergoing combined MV Replacement and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure	Number of patients undergoing combined MV Replacement and CABG who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure Number of MV Replacement + CABG procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), (MtDCStat is Dead in version 2,81 or DischMortStat is Died in Hospital in version 2.9) Version 4.20.2 Number of isolated MV Replacement + CABG procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Patient Expired in the OR (ExpiredInOR), Discharge status (DischMortStat) is Discharged to Hospice OR Died in Hospital	All patients undergoing combined MV Replacement + CABG according to STS Procedure Identification algorithm	
Risk-Adjusted Operative Mortality for MV Repair + CABG Surgery	Percent of patients undergoing combined MV Repair and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure	Number of patients undergoing combined MV Repair and CABG who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure Number of MV Repair + CABG procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), (MtDCStat is Dead in version 2,81 or DischMortStat is Died in Hospital in version 2.9) Version 4.20.2 Number of isolated MV Repair and CABG procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Patient Expired in the OR (ExpiredInOR), Discharge status (DischMortStat) is Discharged to Hospice OR Died in Hospital	All patients undergoing combined MV Repair + CABG according to STS Procedure Identification algorithm	

Domain 1. Absence of Operative Mortality
Proportion of patients (risk-adjusted) who do not experience operative mortality.

Operative mortality:

- All deaths, regardless of cause, occurring during the hospitalization in which the operation was performed, even if after 30 days (including patients transferred to other acute care facilities)

- All deaths, regardless of cause, occurring after discharge from the hospital, but before the end of the thirtieth postoperative day

- All patients discharged to Hospice

Report Overview
STS NQF-endorsed Measures

Risk-Adjusted Operative Mortality for Aortic Valve Replacement (AVR) + CABG Surgery	Percent of patients undergoing combined AVR and CABG who die, including both 1) all deaths occurring during the hospitalization in which the procedure was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure	Number of patients undergoing combined AVR and CABG who die, including both 1) all deaths occurring during the hospitalization in which the operation was performed, even if after 30 days, and 2) those deaths occurring after discharge from the hospital, but within 30 days of the procedure Number of AVR + CABG procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), (MtDCStat is Dead in version 2.81 or DischMortStat is Died in Hospital in version 2.9) Version 4.20.2	All patients undergoing combined AVR + CABG according to STS Procedure Identification algorithm	
		Number of isolated AVR + CABG procedures in which Mortality Operative Death (MtOpD) is marked "yes." Operative mortality is further verified by the following variables: Mortality Status at 30 days (Mt30Stat), Mortality Date (MtDate), Patient Expired in the OR (ExpiredInOR), Discharge status (DischMortStat) is Discharged to Hospice OR Died in Hospital		

Domain 1. Absence of Operative Mortality
Proportion of patients (risk-adjusted) who do not experience operative mortality.

Operative mortality:

- **All deaths, regardless of cause, occurring during the hospitalization in which the operation was performed, even if after 30 days (including patients transferred to other acute care facilities)**

  All deaths, regardless of cause, occurring after discharge from the hospital, but before the end of the thirtieth postoperative day

- **All patients discharged to Hospice**

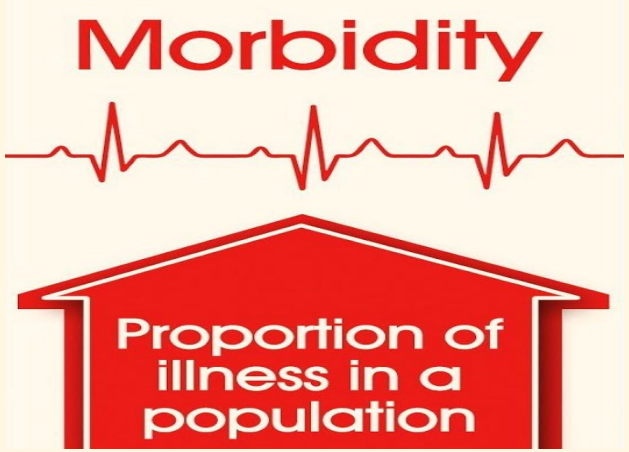
Domain 2. Absence of Major Morbidity

Proportion of patients (risk-adjusted) who do not experience any major morbidity.

For Isolated CABG only

Major morbidity is defined as having at least one of the following adverse outcomes:

- **Reoperations for any cardiac reason (includes: ReOp for Bleeding/Tamponade COpReBld, Reop for Valvular Dysfunction-COpReVlv, Unplanned Coronary Artery intervention-CReintMI, Aortic Reintervention CAortReint and ReOp for Other Cardiac Reasons-COpReOth)**
- **Renal failure**
- **Deep sternal wound infection**
- **Prolonged ventilation/intubation**
- **Cerebrovascular accident/permanent stroke**



Note: The data were analyzed by creating a patient-level composite endpoint: Did the patient experience at least one of the five specified major morbidities (Yes/No)? A participant's performance was measured by the proportion of patients (risk-adjusted) who did not experience any of the morbidities included in the composite endpoint. This is an "any or none" measure.

Report Overview STS NQF-endorsed Measures				
Risk-Adjusted Surgical Re-exploration	Percent of patients aged 18 years and older undergoing isolated CABG who require a return to the operating room for bleeding with or without tamponade, unplanned coronary artery intervention (native vessel, graft or both) , valve dysfunction, aortic reintervention or other cardiac reason	Number of patients undergoing isolated CABG who require return to the operating room for mediastinal bleeding with or without tamponade, unplanned coronary artery intervention (native vessel, graft or both) , valve dysfunction, aortic reintervention or other cardiac reason Number of isolated CABG procedures in which: (version 2.81) ReOp for Bleeding (COpReBld) is marked "yes" OR Reintervention for Graft Occlusion (COpReGft) is marked "yes, surgical" OR "yes, PCI" OR ReOp for Valve Dysfunction (COpReVlv) is marked "yes, surgical" OR "yes, transcatheter" OR ReOp for Other Cardiac Reason (COpReOth) is marked "yes". (version 2.9; 4.20.2) ReOp for Bleeding (COpReBld) is marked "yes" OR ReOp for Valve Dysfunction (COpReVlv) is marked "yes,	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Version 2.9 Cases are removed from the denominator if DischMortStat=Died in Hospital and InHospDthLoc = OR During Initial Surgery Version 4.20.2 Cases are removed from the denominator if the patient expired in OR. (ExpiredInOR = Yes)
		surgical" OR "yes, transcatheter" OR Reint for Myocardial Infarction (CReintMI) is marked "yes" OR Aortic Reint (CAortReint) is marked "yes" OR ReOp for Other Cardiac Reason (COpReOth) is marked "yes".		

Domain 2. Absence of Major Morbidity
Proportion of patients (risk-adjusted) who do not experience any major morbidity.

Isolated CABG patients only

Reoperations for any cardiac reason includes:

- **ReOp for Bleeding/Tamponade**
- **Reop for Valvular Dysfunction**
- **Unplanned Coronary Artery intervention**
- **Aortic Reintervention**
- **ReOp for Other Cardiac Reasons**

****Note – Reop non-cardiac is not included in this measure**

Report Overview

STS NQF-endorsed Measures

Title	Description	Numerator	Denominator	Exclusions
Risk-Adjusted Postoperative Renal Failure	Percent of patients aged 18 years and older undergoing isolated CABG (without pre-existing renal failure) who develop postoperative renal failure or require dialysis	Number of patients undergoing isolated CABG who develop postoperative renal failure or require dialysis Definition of renal failure/dialysis requirement (version 2.81, 2.9, 4.20.2) – Indicate whether the patient had acute renal failure or worsening renal function resulting in ONE OR BOTH of the following: - Increase in serum creatinine level 3.0 x greater than baseline, or serum creatinine level ≥4 mg/dL, Acute rise must be at least 0.5 mg/dl - A new requirement for dialysis postoperatively.	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Patients with documented history of renal failure, baseline serum creatinine ≥4.0; prior renal transplants are not considered pre-operative renal failure unless since transplantation their Cr has been or is ≥4.0 (Dialysis) is marked yes; Last Creatinine Level (CreatLst) ≥4.0 Version 2.9 Cases are removed from the denominator if DischMortStat=Died in Hospital and InHospDthLoc = OR During Initial Surgery Version 4.20.2 Cases are removed from the denominator if the patient expired in OR. (ExpiredInOR = Yes)

Domain 2. Absence of Major Morbidity
Proportion of patients (risk-adjusted) who do not experience any major morbidity.

Isolated CABG patients only

Note the exclusions for V 4.2:

- **Pre-op last Creatinine => 4.0**
- **Pre-op Dialysis = yes**
- **Expired in OR**

If the patient's pre-op creatinine CreatLst is = > 4.0, then do not code post-op renal failure or dialysis as a post-op complication.

If the patient was on dialysis pre-op, then do not code post-op renal failure or dialysis as a post-op complication

Report Overview

STS NQF-endorsed Measures

Title	Description	Numerator	Denominator	Exclusions
Risk-Adjusted Deep Sternal Wound Infection Rate	Percent of patients aged 18 years and older undergoing isolated CABG who, within 30 days postoperatively, develop deep sternal wound infection involving muscle, bone, and/or mediastinum requiring operative intervention	Number of patients who, within 30 days postoperatively develop deep sternal wound infection involving muscle, bone, and/or mediastinum requiring operative intervention. Must have all of the following conditions: • Wound opened with excision of tissue (I&D) or re-exploration of mediastinum • Positive culture unless patient on antibiotics at time of culture or no culture obtained • Treatment with antibiotics beyond perioperative prophylaxis Definition of deep sternal wound infection: Indicate whether a deep sternal wound infection or mediastinitis was diagnosed within 30 days of the procedure or during the hospitalization for surgery, even if after 30 days. Number of isolated CABG procedures in which Post-Op-Deep Sternal Infection / Mediastinitis (DeepSternInf) was marked "Yes, within 30 days of procedure"	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	NOTE: Although the official NQF measure specification does not currently contain reference to the STS variable Mediastinitis (CSternalMedia), the intention is for occurrences of Mediastinitis to also be included under data version 2.73. The variable for data version 2.81 and 2.9, DeepSternInf, includes both deep sternal wound infections and mediastinitis. Version 2.9 Cases are removed from the denominator if DischMortStat=Died in Hospital and InHospDthLoc = OR During Initial Surgery Version 4.20.2 NOTE: Although the official NQF measure specification does not currently contain reference to the STS variable Mediastinitis (CSternalMedia), the intention is for occurrences of Mediastinitis to also be included under data version 2.73. The variable for data version 2.81, 2.9, and 4.20.2, DeepSternInf, includes both deep sternal wound infections and mediastinitis. Patients who expire in the OR are excluded (ExpiredInOR)

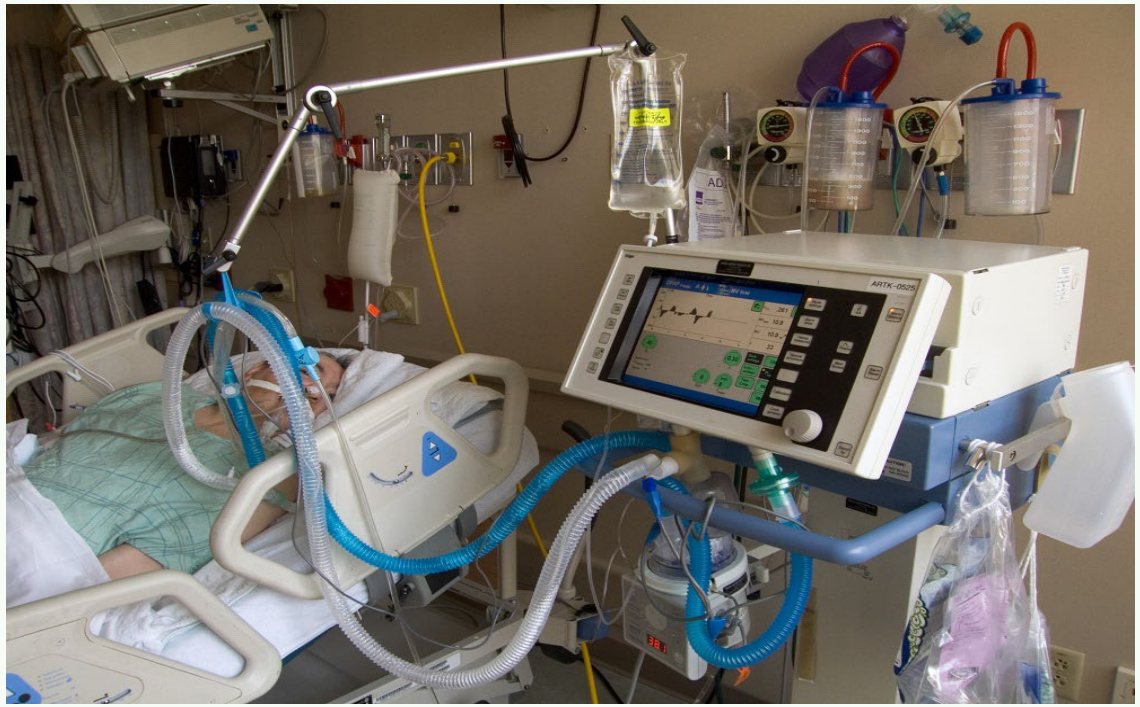
Domain 2. Absence of Major Morbidity
Proportion of patients (risk-adjusted) who do not experience any major morbidity.

Isolated CABG patients only

- **Surgical Site Infection-within 30 days of procedure or during initial hospitalization**
  - **Includes:**
    - **DSWI**
    - **Organ/Space**
    - **Mediastinitis**

- **For SSI - Date of event occurs within 30 days after index procedure where day 1 = the procedure date**

Report Overview STS NQF-endorsed Measures				
Risk-Adjusted Postoperative Prolonged Intubation (Ventilation)	Percent of patients aged 18 years and older undergoing isolated CABG who require intubation for more than 24 hours	Number of patients undergoing isolated CABG who require intubation > 24 hours Number of isolated CABG procedures in which Complications- Pulmonary Vent Prolonged (CPVntLng) is marked "yes"	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Version 2.9 Cases are removed from the denominator if DischMortStat=Died in Hospital and InHospDthLoc = OR During Initial Surgery Version 4.20.2 Cases are removed from the denominator if the patient expired in the OR (ExpiredInOR)



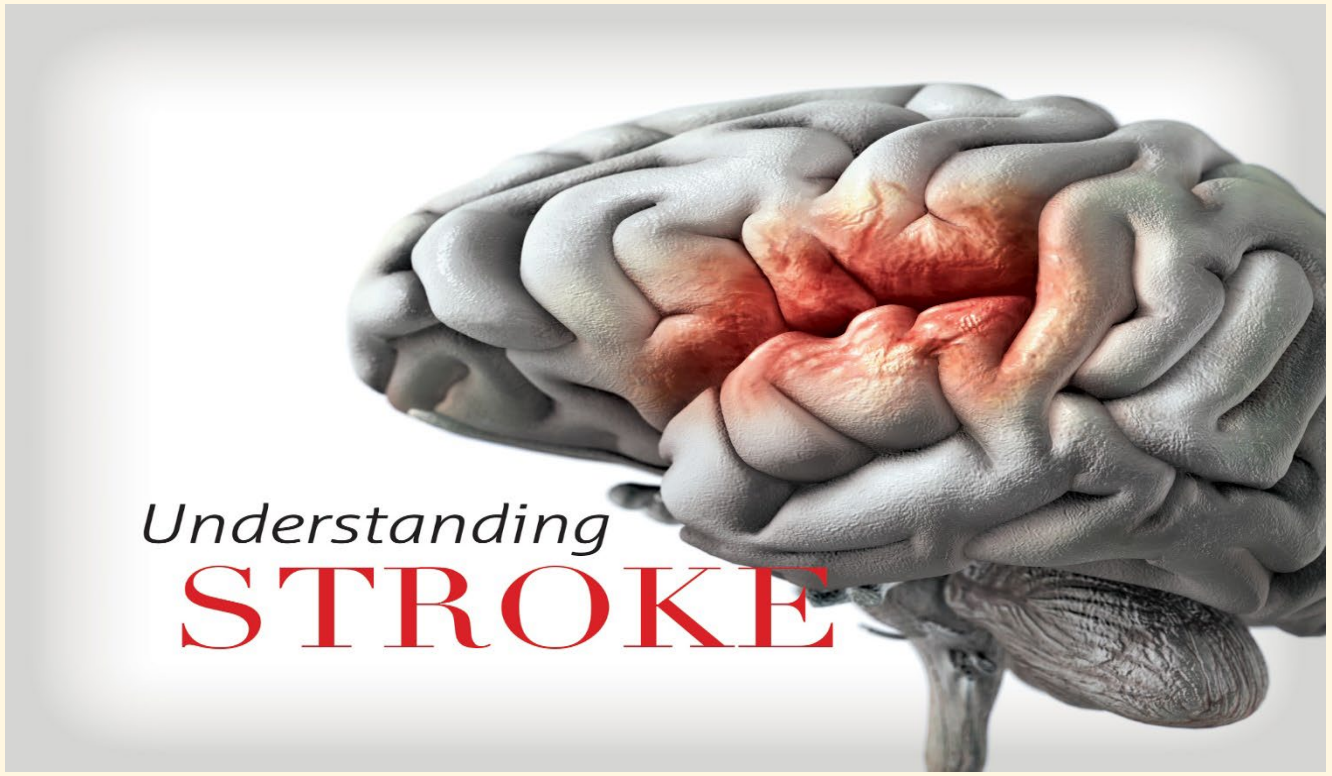
Domain 2. Absence of Major Morbidity

Proportion of patients (risk-adjusted) who do not experience any major morbidity.

Isolated CABG patients only

- **Prolonged Ventilation is defined as ventilation exceeding 24 hours in the postoperative period. This time includes hours from OR exit until extubation, plus any additional hours following reintubation.**

Report Overview STS NQF-endorsed Measures				
Risk-Adjusted Stroke/ Cerebrovascular Accident	Percent of patients aged 18 years and older undergoing isolated CABG who have a postoperative stroke(i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that did not resolve within 24 hours	Number of patients undergoing isolated CABG who have a postoperative stroke (i.e., any confirmed neurological deficit of abrupt onset caused by a disturbance in blood supply to the brain) that did not resolve within 24 hours Number of isolated CABG procedures in which postoperative stroke (CNStrokP) is marked "yes"	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Version 2.9 Cases are removed from the denominator if DischMortStat=Died in Hospital and InHospDthLoc = OR During Initial Surgery Version 4.20.2 Patients who expire in the OR are excluded (ExpiredInOR)



Domain 2. Absence of Major Morbidity
Proportion of patients (risk-adjusted) who do not experience any major morbidity.

Isolated CABG patients only

Report Overview
STS NQF-endorsed Measures

Title	Description	Numerator	Denominator	Exclusions
Use of Internal Mammary Artery (IMA) in Coronary Artery Bypass Graft (CABG)	Percentage of patients aged 18 years and older undergoing isolated CABG who received an internal mammary artery (IMA) graft	Number of patients undergoing isolated CABG who received an internal mammary artery (IMA) graft (version 2.81) Number of isolated CABG procedures in which IMA Artery Used (IMAArtUs) is marked "Left IMA," "Right IMA," or "Both IMAs" (version 2.9, 4.20.2) Number of isolated CABG procedures in which IMA Artery Used (IMAUsed) is marked "Yes"	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Cases are removed from the denominator if the patient had a previous CABG prior to the current admission or if IMA was not used and one of the following reasons was provided: - Subclavian stenosis - Previous cardiac or thoracic surgery - Previous mediastinal radiation - Emergent or salvage procedure - No LAD disease Previous CABG (PrCAB) is marked "yes" or IMAArtUs / IMAUsed is marked "no IMA"/"No" and primary reason for no IMA (NoIMARsn) is marked as any of the following: - Subclavian stenosis - Previous cardiac or thoracic surgery - Previous mediastinal radiation - Emergent or salvage procedure - No LAD disease Version 4.20.2 Cases are removed from the denominator if the patient had a previous CABG prior to the current admission or if IMA was not used and one of the following reasons was provided: - Subclavian stenosis - Previous cardiac or thoracic surgery - Previous mediastinal radiation - Emergent or salvage procedure - No LAD disease - Other – acceptable STS provided exclusion
				Previous CABG (PrCAB) is marked "yes" or IMAArtUs / IMAUsed is marked "no IMA"/"No" and primary reason for no IMA (NoIMARsn) is marked as any of the following: - Subclavian stenosis - Previous cardiac or thoracic surgery - Previous mediastinal radiation - Emergent or salvage procedure - No LAD disease - Other – acceptable STS provided exclusion

Domain 3. Use of Internal Mammary Artery (IMA)

Proportion of first-time CABG patients who receive at least one IMA graft.

Isolated CABG patients only

Exclusions:

Prior CABG or the IMA is not used for one of the following reasons:

- **Subclavian stenosis**
- **Previous cardiac or thoracic surgery**
- **Previous mediastinal radiation**
- **Emergent or salvage procedure**
- **No (BYPASSABLE) LAD disease**
- **Other - acceptable STS provided exclusion**
  - **If you select this reason, the situation must be adjudicated by Surgeon Leadership of STS and deemed to be acceptable unless there are specific instructions in the Training Manual that relate to the situation, in that case, use the instructions in the Training Manual which have been approved by Surgeon Leadership.**

Domain 4. Use of All Evidence-based Perioperative Medications
Proportion of patients who receive all required perioperative medications

For Isolated CABG only

The required perioperative medications are:

- **Preoperative beta blockade therapy**
- **Discharge anti-platelet medication includes Aspirin-DCASA, ADP Inhibitor-DCADP, and Other Antiplatelet**
- **Discharge beta blockade therapy**
- **Discharge anti-lipid medication**

Note: The endpoint that was analyzed was a composite endpoint, defined by the following question:

- **Did the patient receive all the medications (among the four specified) that the patient was eligible to receive (Yes/No)?**

Report Overview
STS NQF-endorsed Measures

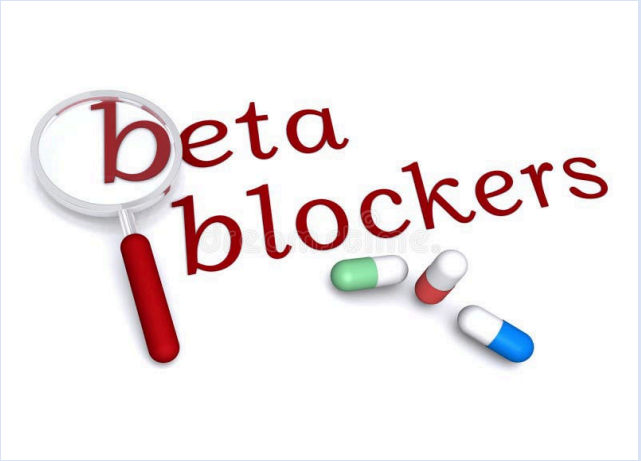
Preoperative Beta Blockade	Percent of patients aged 18 years and older undergoing isolated CABG who received beta blockers within 24 hours preceding surgery.	Number of patients undergoing isolated CABG who received beta blockers within 24 hours preceding surgery Number of isolated CABG procedures in which preoperative beta blockers (MedBeta) is marked "yes"	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Cases are removed from the denominator if preoperative beta blocker was contraindicated or if the clinical status of the patient was emergent or emergent salvage prior to entering the operating room. MedBeta is marked as "Contraindicated" Cases are also removed from the denominator if Status is marked 'Emergent' or 'Salvage' Version 4.20.2 Cases are removed from the denominator if preoperative beta blocker was contraindicated or if the clinical status of the patient was emergent or emergent salvage prior to entering the operating room. MedBeta is marked as "Contraindicated" Cases are also removed from the denominator if Status (Status) is marked 'Emergent' or ' Emergent Salvage'

Domain 4. Use of All Evidence-based Perioperative Medications

Isolated CABG patients only

Note Exclusions:

- **Pre-op BB = contraindicated**
- **Status = emergent/salvage**



Anti-Platelet Medication at Discharge	Percent of patients aged 18 years and older undergoing isolated CABG who were discharged on anti-platelet medication	Number of patients undergoing isolated CABG who were discharged on anti- platelet medication Number of isolated CABG procedures in which: (version 2.81) Discharge aspirin (DCASA) is marked "yes" OR discharge ADP inhibitors (DCADP) is marked "yes" OR discharge P2Y12 antagonist (DCP2Y12) is marked "yes" OR Other discharge anti-platelet (DCOthAntiPlat) is marked "yes". (version 2.9; 4.20.2) Discharge aspirin (DCASA) is marked "yes" OR discharge ADP inhibitors (DCADP) is marked "yes" OR Other discharge anti-platelet (DCOthAntiPlat) is marked "yes".	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Cases are removed from the denominator if there was an in- hospital mortality or if discharge aspirin OR discharge ADP inhibitor OR other discharge anti-platelet was contraindicated. Mortality Discharge Status (MtDCStat/ DischMortStat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality; (version 2.81) Discharge aspirin (DCASA) OR discharge ADP inhibitors (DCADP) OR discharge P2Y12 antagonist (DCP2Y12) OR Other discharge anti-platelet (DCOthAntiPlat) is marked "contraindicated" (version 2.9) Discharge aspirin (DCASA) OR discharge ADP inhibitors (DCADP OR Other discharge anti-platelet (DCOthAntiPlat) is marked "contraindicated" (version 4.20.2) Cases are removed from the denominator if there was an in-hospital mortality or if discharge aspirin OR discharge ADP inhibitor OR other discharge anti-platelet was contraindicated OR the patient was discharged to Hospice OR the patients discharge location is Left AMA. Expired in OR (ExpiredInOR), Mortality
				Discharge Status (DischMort Stat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality; Discharge aspirin (DCASA) OR discharge ADP inhibitor (CDCADP) OR Other discharge antiplatelet (DCOthAntiPlat) is marked 'contraindicated' OR Discharge location (DisLoctn) is LeftAMA OR Discharge Status (DischMortStat) is Discharged to Hospice

Domain 4. Use of All Evidence-based Perioperative Medications

Isolated CABG patients only

Note Exclusions:

- Expired in OR / In-Hospital Mortality
- Left AMA /Discharged to Hospice
- Discharge aspirin OR discharge ADP inhibitor OR other discharge anti-platelet was contraindicated
  - Update Clarification September 2024 –To avoid patient removal from the denominator, please code 'No' to the other anti-platelet medications instead of contraindicated if the patient is sent home on one of the three anti-platelet medications.
    - For example, patient is ordered ASA on discharge and the Provider documents that an ADP is contraindicated in the medical record, code 'Yes' to discharge Aspirin and 'No' to discharge ADP Inhibitor.
    - If none of the three anti-platelet medications are ordered on discharge, then there must be a documented contraindication as above in order to code the medication as contraindicated.

Report Overview STS NQF-endorsed Measures				
Beta Blockade at Discharge	Percent of patients aged 18 years and older undergoing isolated CABG who were discharged on beta blockers	Number of patients undergoing isolated CABG who were discharged on beta blockers Number of isolated CABG procedures in which discharge beta blockers (DCBeta) is marked "yes"	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Cases are removed from the denominator if there was an in-hospital mortality or if discharge beta blocker was contraindicated. Mortality Discharge Status (MtDCStat/ DischMortStat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality; discharge beta blocker (DCBeta) marked as "contraindicated" Version 4.20.2 Cases are removed from the denominator if there was an in-hospital mortality or beta blocker (DC Beta) is marked contraindicated OR the patient was discharged to Hospice OR the patients discharge location is Left AMA. Expired In OR (ExpiredInOR), Mortality Discharge Status (DischMortStat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality. Discharge Beta Blocker (DCBeta) is marked 'contraindicated' OR Discharge location (DisLoctn) is Left AMA OR Discharge Status (DischMortStat) is Discharged to Hospice

Domain 4. Use of All Evidence-based Perioperative Medications

Isolated CABG patients only

Note Exclusions:

- **Expired in OR**
- **In-Hospital Mortality**
- **Left AMA**
- **Discharged to Hospice**
- **Discharge Beta Blocker was contraindicated**

Anti-Lipid Treatment at Discharge	Percent of patients aged 18 years and older undergoing isolated CABG who were discharged on a lipid-lowering statin *NOTE: Beginning with data version 2.81 only statins are considered for this measure.*	Number of patients undergoing isolated CABG who were discharged on a lipid-lowering statin Number of isolated CABG procedures in which: Discharge statin medication (DCLipLowStat) is marked "yes"	All patients undergoing isolated CABG according to STS Procedure Identification algorithm	Cases are removed from the denominator if there was an in- hospital mortality or if discharge anti-lipid treatment was contraindicated. Mortality Discharge Status (MtDCStat/ DischMortStat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality; Discharge statin medication (DCLipLow Stat) is marked as "contraindicated" Version 4.20.2 Cases are removed from the denominator if there was an in- hospital mortality or Lipid Lowering Statin (DCLipLowStat) is marked contraindicated OR the patient was discharged to Hospice OR the patients discharge location is Left AMA. Expired In OR (ExpiredInOR), Mortality Discharge Status (DischMortStat), Mortality Date (MtDate), and Discharge Date (DischDt) indicate an in-hospital mortality. Discharge Lipid Lower Statin (DCLipLowStat) is marked 'contraindicated' OR Discharge location (DisLoctn) is' Left AMA' OR Discharge Status (DischMortStat) is Discharged to Hospice

Domain 4. Use of All Evidence-based Perioperative Medications

Isolated CABG patients only

*****Beginning with data version 2.81, only statins are considered for this measure.**

Note Exclusions:

- **Expired in OR**
- **In-Hospital Mortality**
- **Left AMA**
- **Discharged to Hospice**
- **Discharge Statin was contraindicated**

STAR Rating

STAR ratings are derived by testing whether the participant's composite or domain score is significantly different from the overall STS average.

- **For example, if for each of the 4 composite score domains, a participant's estimated score is lower than the overall STS average, but the difference between the participant and STS is not statistically significant, the ratings would each be 2 stars.**
- **If, however, for the overall composite, the point estimate is lower than the STS average, AND this difference is statistically significant, the overall participant star rating is 1 star.**

Column 2 Quality Rating

The participant rating system assigns participants to quality rating categories designated by one, two, or three stars

Domain	Rating	Participant		STS				
		Score	95% CI	Score	Min - Max	10th	50th	90th
Overall	★★★	**98.23%**	(97.86-98.55)	**96.97%**	(90.30-99.18)	95.49%	97.17%	98.22%
Absence of Mortality	★★★	**98.36%**	(97.81-98.81)	**97.57%**	(91.41-99.39)	96.25%	97.76%	98.66%
Absence of Morbidity	★★★	**94.83%**	(93.83-95.74)	**90.64%**	(75.81-96.84)	86.70%	91.11%	94.04%
Use of IMA	★★★	**99.77%**	(99.55-99.91)	**99.54%**	(88.21-99.99)	99.02%	99.76%	99.95%
Medications	★★	**94.81%**	(93.92-95.66)	**95.45%**	(25.75-99.98)	89.72%	97.87%	99.68%

The rating categories are defined as follows:

★★★ → Participant performance is significantly higher than STS mean.

★★ → Participant performance is not statistically different from STS mean.

★ → Participant performance is significantly lower than STS mean.

****Mean is the average of all scores across all the participants in the analysis**

Column 3 Participant Score and Bayesian Credible Interval

Domain	Rating	Participant		STS				
		Score	95% CI	Score	Min - Max	10th	50th	90th
Overall	★★★	**98.23%**	(97.86-98.55)	**96.97%**	(90.30-99.18)	95.49%	97.17%	98.22%
Absence of Mortality	★★★	**98.36%**	(97.81-98.81)	**97.57%**	(91.41-99.39)	96.25%	97.76%	98.66%
Absence of Morbidity	★★★	**94.83%**	(93.83-95.74)	**90.64%**	(75.81-96.84)	86.70%	91.11%	94.04%
Use of IMA	★★★	**99.77%**	(99.55-99.91)	**99.54%**	(88.21-99.99)	99.02%	99.76%	99.95%
Medications	★★	**94.81%**	(93.92-95.66)	**95.45%**	(25.75-99.98)	89.72%	97.87%	99.68%

The participant score is a number that summarizes the participant's estimated performance within the indicated domain of quality.

Bayesian Credible Intervals shows the range in which the participant's true score is likely to lie. Ninety-five percent (95%) credible intervals are used for analyzed procedures.

- **The Bayesian credible interval has an intuitive probability interpretation. For example, based on the observed data, we can state that it is 95% likely that the true proportion falls within the upper and lower limits of the 95% credible interval.**
- **If the lower limit of the 95% Bayesian credible interval is greater than the STS average value, then it is at least 97.5% likely (95% credible interval plus the 2.5%upper tail) that the participant's true performance exceeds the STS average value.**
- **If the upper limit of the 95% Bayesian credible interval is less than the STS value, then it is at least 97.5% likely (95% credible interval plus 2.5% lower tail) that the participant's true performance is less than (i.e., worse than) the STS value.**

****Note Credible Interval and Confidence Interval are used interchangeably in the Analysis Overview and Reports**

Participant score higher than STS score and STS score lower than the site's lowest value in the CI = 3 STARS

Domain	Rating	Participant		STS				
		Score	98% CI	Score	Min - Max	10th	50th	90th
Overall	★★★	97.55%	(96.70-98.22)	96.68%	(91.08-98.92)	95.12%	96.86%	97.98%
Absence of Mortality	★★	97.78%	(96.57-98.65)	97.42%	(92.79-99.19)	96.22%	97.56%	98.44%

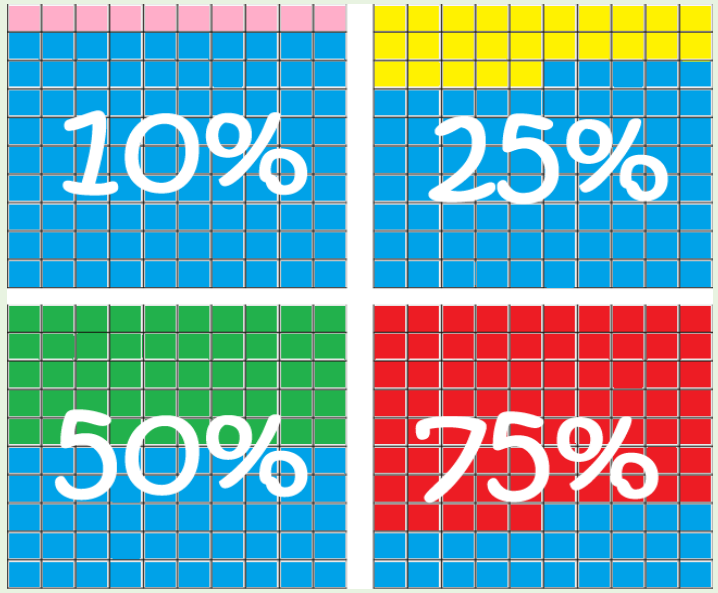
Participant score higher than STS score and STS score is in the site's CI = 2 STARS

Main Take Away – STAR Rating – It's not all about you!

Column 4 STS Mean Participant Score

Domain	Rating	Participant		STS				
		Score	95% CI	Score	Min - Max	10th	50th	90th
Overall	★★★	**98.23%**	(97.86-98.55)	**96.97%**	(90.30-99.18)	95.49%	97.17%	98.22%
Absence of Mortality	★★★	**98.36%**	(97.81-98.81)	**97.57%**	(91.41-99.39)	96.25%	97.76%	98.66%
Absence of Morbidity	★★★	**94.83%**	(93.83-95.74)	**90.64%**	(75.81-96.84)	86.70%	91.11%	94.04%
Use of IMA	★★★	**99.77%**	(99.55-99.91)	**99.54%**	(88.21-99.99)	99.02%	99.76%	99.95%
Medications	★★	**94.81%**	(93.92-95.66)	**95.45%**	(25.75-99.98)	89.72%	97.87%	99.68%

The STS mean participant score is the average of all scores across all the participants in the analysis. This score serves as a useful benchmark for assessing a participant's performance compared to the overall STS performance.



Column 5 Distribution of Participant Scores

Domain	Rating	Participant		STS				
		Score	95% CI	Score	Min - Max	10th	50th	90th
Overall	★★★	98.23%	(97.86-98.55)	96.97%	(90.30-99.18)	95.49%	97.17%	98.22%
Absence of Mortality	★★★	98.36%	(97.81-98.81)	97.57%	(91.41-99.39)	96.25%	97.76%	98.66%
Absence of Morbidity	★★★	94.83%	(93.83-95.74)	90.64%	(75.81-96.84)	86.70%	91.11%	94.04%
Use of IMA	★★★	99.77%	(99.55-99.91)	99.54%	(88.21-99.99)	99.02%	99.76%	99.95%
Medications	★★	94.81%	(93.92-95.66)	95.45%	(25.75-99.98)	89.72%	97.87%	99.68%

This summarizes the distribution of participant scores across all participants who were included in the analysis.

The labels “Min” and “Max” denote the estimated lowest and highest participant scores, among all participants in the analysis.

The labels “10th”, “50th”, and “90th” denote the 10th, 50th, and 90th percentiles of the distribution across participants.

- **10th percentile: The value under which 10% of the individual values lie.**
- **50th percentile: The value under which 50% of the individual values lie.**
- **90th percentile: The value under which 90% of the individual values lie.**

Data Analyses of The Society of Thoracic Surgeons

Participant: 99999

STS Period Ending Sep 2024

Quality Ratings	Quality Rating Details	Rating Trends	Process and Outcome Measures
CABG	CABG	Rating Trends	CABG Process Measures
AVR	AVR		CABG Outcome Measures
AVR + CABG	AVR + CABG		All Cardiac Surgeries Process Measures
MVRR	MVRR		Mortality Outcome Measures
MVRR + CABG	MVRR + CABG		

Risk Adjusted and Regional Outcomes	Benchmark Reports	Anesthesia Report
Isolated CABG	Isolated CABG	Anesthesia - CABG Procedures
Isolated CABG - Subset: On Pump Procedures	Isolated CABG - Subset: On Pump Procedures	Anesthesia - Valve Procedures
Isolated CABG - Subset: Off Pump Procedures	Isolated CABG - Subset: Off Pump Procedures	
Isolated CABG - Subset: First Operations	Isolated CABG - Subset: First Operations	
Isolated CABG - Subset: Reoperations	Isolated CABG - Subset: Reoperations	
Isolated Aortic Valve Replacement	Isolated Aortic Valve Replacement	
Isolated Aortic Valve Replacement + CABG	Isolated Aortic Valve Replacement + CABG	
Isolated Mitral Valve Replacement	Isolated Mitral Valve Replacement	
Isolated Mitral Valve Replacement + CABG	Isolated Mitral Valve Replacement + CABG	
Isolated Mitral Valve Repair	Isolated Mitral Valve Repair	
Isolated Mitral Valve Repair + CABG	Isolated Mitral Valve Repair + CABG	
Multivalve	Multivalve	
MultiValve + CABG	MultiValve + CABG	
All		

The process measures provide data on the frequency of usage of five therapies among subsets of isolated CABG patients

The therapies are:

- **Preoperative beta blockade therapy**
  Use of IMA
- **Discharge anti-platelet medication**
  Discharge beta blockade therapy
  Discharge anti- lipid medication

The Society of Thoracic Surgeons

CABG Process Measures

Participant: 99999

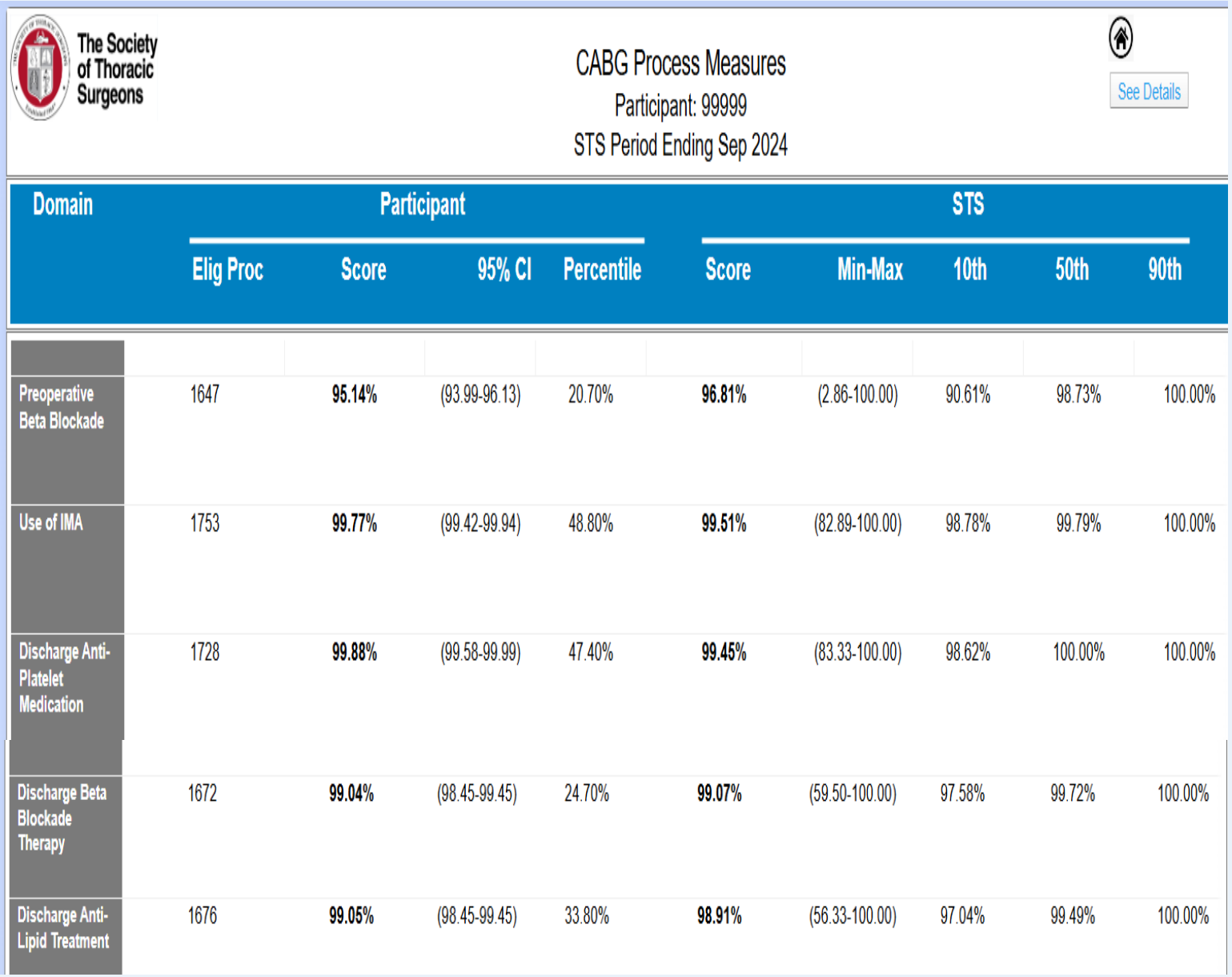
STS Period Ending Sep 2024

See Details

Domain	Participant				STS				
	Elig Proc	Score	95% CI	Percentile	Score	Min-Max	10th	50th	90th
Preoperative Beta Blockade	1647	**95.14%**	(93.99-96.13)	20.70%	**96.81%**	(2.86-100.00)	90.61%	98.73%	100.00%
Use of IMA	1753	**99.77%**	(99.42-99.94)	48.80%	**99.51%**	(82.89-100.00)	98.78%	99.79%	100.00%
Discharge Anti-Platelet Medication	1728	**99.88%**	(99.58-99.99)	47.40%	**99.45%**	(83.33-100.00)	98.62%	100.00%	100.00%
Discharge Beta Blockade Therapy	1672	**99.04%**	(98.45-99.45)	24.70%	**99.07%**	(59.50-100.00)	97.58%	99.72%	100.00%
Discharge Anti-Lipid Treatment	1676	**99.05%**	(98.45-99.45)	33.80%	**98.91%**	(56.33-100.00)	97.04%	99.49%	100.00%

Process Measures: Participant

- **The number of Eligible Procedures is the number of cases performed by the participant who meet the eligibility requirements**
- **Participant Usage (Score) is the percentage of eligible Isolated CABG cases for which the patient received the specified therapy**
- **Bayesian Credible Intervals (CI) shows the range in which the participant's true score is likely to lie.**
- **The Participant Percentile indicates the percentage of STS participants who applied the therapy in their respective populations less frequently than or as frequently as your institution did**



The Society of Thoracic Surgeons

CABG Process Measures
Participant: 99999
STS Period Ending Sep 2024

See Details

Domain	Participant				STS				
	Elig Proc	Score	95% CI	Percentile	Score	Min-Max	10th	50th	90th
Preoperative Beta Blockade	1647	**95.14%**	(93.99-96.13)	20.70%	**96.81%**	(2.86-100.00)	90.61%	98.73%	100.00%
Use of IMA	1753	**99.77%**	(99.42-99.94)	48.80%	**99.51%**	(82.89-100.00)	98.78%	99.79%	100.00%
Discharge Anti-Platelet Medication	1728	**99.88%**	(99.58-99.99)	47.40%	**99.45%**	(83.33-100.00)	98.62%	100.00%	100.00%
Discharge Beta Blockade Therapy	1672	**99.04%**	(98.45-99.45)	24.70%	**99.07%**	(59.50-100.00)	97.58%	99.72%	100.00%
Discharge Anti-Lipid Treatment	1676	**99.05%**	(98.45-99.45)	33.80%	**98.91%**	(56.33-100.00)	97.04%	99.49%	100.00%

Process Measures: STS

- **The Overall STS Usage Score is the percent of all eligible patients in the entire STS population who received the specified therapy**

- **Distribution of Participant Scores. This summarizes the distribution of participant scores across all participants who were included in the analysis.**
  - **The labels “Min” and “Max” denote the estimated lowest and highest participant scores, among all participants in the analysis.**
  - **The 10th, 50th, and 90th percentiles of the distribution across participants.**
    - **10th percentile: The value under which 10% of the individual values lie.**
    - **50th percentile: The value under which 50% of the individual values lie.**
    - **90th percentile: The value under which 90% of the individual values lie.**

Data Analyses of The Society of Thoracic Surgeons

Participant: 99999

STS Period Ending Sep 2024

Quality Ratings	Quality Rating Details	Rating Trends	Process and Outcome Measures
CABG	CABG	Rating Trends	CABG Process Measures
AVR	AVR		CABG Outcome Measures
AVR + CABG	AVR + CABG		All Cardiac Surgeries Process Measures
MVRR	MVRR		Mortality Outcome Measures
MVRR + CABG	MVRR + CABG		

Risk Adjusted and Regional Outcomes	Benchmark Reports	Anesthesia Report
Isolated CABG	Isolated CABG	Anesthesia - CABG Procedures
Isolated CABG - Subset: On Pump Procedures	Isolated CABG - Subset: On Pump Procedures	Anesthesia - Valve Procedures
Isolated CABG - Subset: Off Pump Procedures	Isolated CABG - Subset: Off Pump Procedures	
Isolated CABG - Subset: First Operations	Isolated CABG - Subset: First Operations	
Isolated CABG - Subset: Reoperations	Isolated CABG - Subset: Reoperations	
Isolated Aortic Valve Replacement	Isolated Aortic Valve Replacement	
Isolated Aortic Valve Replacement + CABG	Isolated Aortic Valve Replacement + CABG	
Isolated Mitral Valve Replacement	Isolated Mitral Valve Replacement	
Isolated Mitral Valve Replacement + CABG	Isolated Mitral Valve Replacement + CABG	
Isolated Mitral Valve Repair	Isolated Mitral Valve Repair	
Isolated Mitral Valve Repair + CABG	Isolated Mitral Valve Repair + CABG	
Multivalve	Multivalve	
MultiValve + CABG	MultiValve + CABG	
All		

The CABG outcome measures provide risk-adjusted analyses of mortality and morbidity for several procedure groups.

Outcome Measures

The outcome measures provide risk- adjusted analyses of mortality and morbidity for several procedure groups. The main summary statistic provided is the Participant's Estimated Odds Ratio (OR) based on a hierarchical logistic regression analysis. The OR measures the impact that a participant's performance level has on a patient's probability of experiencing an adverse outcome.

Domain	Participant					STS				
	Elig Proc	Est OR	95% CI	Percentile	Observ Rate	Est OR	Min-Max	10th	50th	90th
Deep Sternal Infection / Mediastinitis	1768	0.71	(0.29-1.79)	83.50%	0.11%	1.00	(0.38-12.12)	1.82	0.90	0.67
Post-Op Renal Insufficiency (Failure)	1733	0.52	(0.34-0.80)	97.70%	0.92%	1.00	(0.26-3.33)	1.56	0.99	0.65
Surgical Re-exploration	1768	0.88	(0.66-1.18)	65.90%	2.26%	1.00	(0.36-2.60)	1.53	0.99	0.67
Stroke/ Cerebrovascular	1768	0.60	(0.39-0.93)	98.90%	0.57%	1.00	(0.44-2.20)	1.36	0.99	0.75
Prolonged Intubation (Ventilation)	1768	0.40	(0.30-0.54)	97.80%	2.43%	1.00	(0.26-10.69)	1.89	0.99	0.55

- **An OR greater than 1.0 implies that the participant increases a patient's risk of experiencing the outcome, compared to an "average" STS participant.**
- **An OR less than 1.0 implies that the participant decreases a patient's risk of experiencing the outcome, compared to an "average" STS participant.**

****The Odds Ratio supplied in the STS participant report cannot be calculated by participants. The Odds Ratio is calculated using a hierarchical analysis technique that uses data on all STS participants. For this reason, the participant report generated by STS is the only resource containing the Odds Ratio.**

Domain	Participant					STS				
	Elig Proc	Est OR	95% CI	Percentile	Observ Rate	Est OR	Min-Max	10th	50th	90th
Deep Sternal Infection / Mediastinitis	1768	0.71	(0.29-1.79)	83.50%	0.11%	1.00	(0.38-12.12)	1.82	0.90	0.67
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Surgical Re-exploration	1768	0.88	(0.66-1.18)	65.90%	2.26%	1.00	(0.36-2.60)	1.53	0.99	0.67
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Prolonged Intubation (Ventilation)	1768	0.40	(0.30-0.54)	97.80%	2.43%	1.00	(0.26-10.69)	1.89	0.99	0.55

Outcome Measures: Participant

- **The column labeled Eligible Procedures indicates the number of patients who met the inclusion criteria to be included in the analysis for the indicated measure.**
- **Participant Estimated Odds Ratio (OR)**
- **Bayesian Credible Intervals (CI) shows the range in which the participant's true score is likely to lie.**
- **The Participant Percentile is the percent of STS participants who have an estimated OR that is greater than or equal to your estimated OR**
- **The Observed Participant Rate is the percentage of eligible patients who experienced the specified outcome. Unlike the participant estimated OR, the observed participant rate is not risk-adjusted.**

Domain	Participant					STS				
	Elig Proc	Est OR	95% CI	Percentile	Observ Rate	Est OR	Min-Max	10th	50th	90th
Deep Sternal Infection / Mediastinitis	1768	0.71	(0.29-1.79)	83.50%	0.11%	1.00	(0.38-12.12)	1.82	0.90	0.67
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Outcome Measures: STS

- **EST OR is the Odds Ratio for the STS. It is always 1.**
  - **When the O/E Ratio is 1, the participant had an observed outcome level equal to expected. The participant performed as expected.**
- **The labels “Min” and “Max” denote the estimated lowest and highest participant scores, among all participants in the analysis.**
- **The 10th, 50th, and 90th percentiles of the distribution across participants.**
  - **10th percentile: The value under which 10% of the individual values lie.**
  - **50th percentile: The value under which 50% of the individual values lie.**
  - **90th percentile: The value under which 90% of the individual values lie.**

Data Analyses of The Society of Thoracic Surgeons

Participant: 99999

STS Period Ending Sep 2024

Quality Ratings	Quality Rating Details	Rating Trends	Process and Outcome Measures
CABG	CABG	Rating Trends	CABG Process Measures
AVR	AVR		CABG Outcome Measures
AVR + CABG	AVR + CABG		All Cardiac Surgeries Process Measures
MVRR	MVRR		Mortality Outcome Measures
MVRR + CABG	MVRR + CABG		

Risk Adjusted and Regional Outcomes	Benchmark Reports	Anesthesia Report
Isolated CABG	Isolated CABG	Anesthesia - CABG Procedures
Isolated CABG - Subset: On Pump Procedures	Isolated CABG - Subset: On Pump Procedures	Anesthesia - Valve Procedures
Isolated CABG - Subset: Off Pump Procedures	Isolated CABG - Subset: Off Pump Procedures	
Isolated CABG - Subset: First Operations	Isolated CABG - Subset: First Operations	
Isolated CABG - Subset: Reoperations	Isolated CABG - Subset: Reoperations	
Isolated Aortic Valve Replacement	Isolated Aortic Valve Replacement	
Isolated Aortic Valve Replacement + CABG	Isolated Aortic Valve Replacement + CABG	
Isolated Mitral Valve Replacement	Isolated Mitral Valve Replacement	
Isolated Mitral Valve Replacement + CABG	Isolated Mitral Valve Replacement + CABG	
Isolated Mitral Valve Repair	Isolated Mitral Valve Repair	
Isolated Mitral Valve Repair + CABG	Isolated Mitral Valve Repair + CABG	
Multivalve	Multivalve	
MultiValve + CABG	MultiValve + CABG	
All		

The ‘All Cardiac Surgery’ process measures provide data on:

- **Antibiotic Selection**
- **Antibiotic Timing**
- **Antibiotic Discontinuation**

‘All Cardiac Surgery’ measures

- **The number of Eligible Procedures is the number of cases performed by the participant who meet the eligibility requirements**
- **Participant Usage (Score) is the percentage of eligible Isolated CABG cases for which the patient received the specified therapy**
- **Bayesian Credible Intervals (CI) shows the range in which the participant’s true score is likely to lie.**
- **The Participant Percentile indicates the percentage of STS participants who applied the therapy in their respective populations less frequently than or as frequently as your institution did**
- **The Overall STS Usage Score is the percent of all eligible patients in the entire STS population who received the specified therapy**

The Society of Thoracic Surgeons

Cardiac Surgeries
Participant: 99999
STS Period Ending Sep 2024

See Details

Domain	Participant				STS				
	Elig Proc	Score	95% CI	Percentile	Score	Min-Max	10th	50th	90th
Duration of Antibiotic Prophylaxis	3111	**99.68%**	(99.41-99.85)	51.30%	**99.04%**	(49.65-100.00)	98.10%	99.67%	100.00%
Selection of Antibiotic Prophylaxis	3120	**99.71%**	(99.45-99.87)	37.30%	**99.34%**	(69.82-100.00)	98.79%	99.86%	100.00%
Timing of Antibiotic Prophylaxis	3123	**92.03%**	(91.02-92.95)	3.80%	**98.37%**	(50.00-100.00)	96.23%	99.32%	100.00%

- **The labels “Min” and “Max” denote the estimated lowest and highest participant scores, among all participants in the analysis.**
- **The 10th, 50th, and 90th percentiles of the distribution across participants.**
  - **10th percentile: The value under which 10% of the individual values lie.**
  - **50th percentile: The value under which 50% of the individual values lie.**
  - **90th percentile: The value under which 90% of the individual values lie**

Report Overview
STS NQF-endorsed Measures

Title	Description	Numerator	Denominator	Exclusions
Selection of Antibiotic Prophylaxis for Cardiac Surgery Patients	Percent of patients aged 18 years and older undergoing cardiac surgery who received preoperative prophylactic antibiotics recommended for the operation.	Number of patients undergoing cardiac surgery who received a first generation or second generation cephalosporin prophylactic antibiotic (e.g., cefazolin, cefuroxime, cefamandole) preoperatively or in the event of a documented allergy, an alternate antibiotic choice (e.g., vancomycin, clindamycin) was ordered and administered preoperatively. Number of cardiac surgery procedures in which appropriate antibiotic selection (AbxSelect) is marked "yes"	Number of patients undergoing cardiac surgery (See Timing of Antibiotic Prophylaxis above)	Cases are removed from the denominator if the patient had a documented contraindication or rationale for not administering antibiotic in medical record.
Timing of Antibiotic Prophylaxis for Cardiac Surgery Patients NOTE: This is an NQF measure sponsored by the Centers for Medicare and Medicaid Services	Percent of patients aged 18 years and older undergoing cardiac surgery who received prophylactic antibiotics within one hour of surgical incision or start of procedure if no incision was required (two hours if receiving vancomycin or fluoroquinolone)	Number of patients undergoing cardiac surgery who received prophylactic antibiotics within one hour of surgical incision or start of procedure if no incision was required (two hours if vancomycin or fluoroquinolone) Number of cardiac surgery procedures in which timing of appropriate antibiotic administration (AbxTiming) is marked "yes"	Number of patients undergoing cardiac surgery A cardiac procedure is determined as a procedure for which at least one of the following is not marked "no" or "missing": OpCAB, OpValve, VADProc, VADImp, OpOCard, ECMO, AortProc, AFibProc	Cases are removed from the denominator if the patient had a documented contraindication or rationale for not administering antibiotic in medical record.
Duration of Antibiotic Prophylaxis for Cardiac Surgery Patients	Percent of patients aged 18 years and older undergoing cardiac surgery whose prophylactic antibiotics were discontinued within 48 hours after surgery end time	Number of patients undergoing cardiac surgery whose prophylactic antibiotics were discontinued within 48 hours after surgery end time Number of cardiac surgery procedures in which appropriate antibiotic discontinuation (AbxDisc) is marked "yes"	Number of patients undergoing cardiac surgery (See Timing of Antibiotic Prophylaxis above)	AbxDisc is marked "Exclusion" Version 2.9 AbxDisc is marked "Exclusion" OR DischMortStat=Died in Hospital and InHospDthLoc = OR During Initial Surgery V4.20.2 AbxDisc is marked "Exclusion" OR patient expired in the OR (ExpiredInOR)

All Cardiac Surgeries

A cardiac procedure is determined as a procedure for which at least one of the following is not marked "no" or "missing":

- **OpCAB**
- **OpValve**
- **VADProc**
- **VADImp**
- **OpOCard**
- **ECMO**
- **AortProc**
- **AFibProc**

****Note – The Training Manual includes the complete list of exclusions**

Data Analyses of The Society of Thoracic Surgeons

Participant: 99999

STS Period Ending Sep 2024

Quality Ratings	Quality Rating Details	Rating Trends	Process and Outcome Measures
CABG	CABG	Rating Trends	CABG Process Measures
AVR	AVR		CABG Outcome Measures
AVR + CABG	AVR + CABG		All Cardiac Surgeries Process Measures
MVRR	MVRR		Mortality Outcome Measures
MVRR + CABG	MVRR + CABG		

Risk Adjusted and Regional Outcomes	Benchmark Reports	Anesthesia Report
Isolated CABG	Isolated CABG	Anesthesia - CABG Procedures
Isolated CABG - Subset: On Pump Procedures	Isolated CABG - Subset: On Pump Procedures	Anesthesia - Valve Procedures
Isolated CABG - Subset: Off Pump Procedures	Isolated CABG - Subset: Off Pump Procedures	
Isolated CABG - Subset: First Operations	Isolated CABG - Subset: First Operations	
Isolated CABG - Subset: Reoperations	Isolated CABG - Subset: Reoperations	
Isolated Aortic Valve Replacement	Isolated Aortic Valve Replacement	
Isolated Aortic Valve Replacement + CABG	Isolated Aortic Valve Replacement + CABG	
Isolated Mitral Valve Replacement	Isolated Mitral Valve Replacement	
Isolated Mitral Valve Replacement + CABG	Isolated Mitral Valve Replacement + CABG	
Isolated Mitral Valve Repair	Isolated Mitral Valve Repair	
Isolated Mitral Valve Repair + CABG	Isolated Mitral Valve Repair + CABG	
Multivalve	Multivalve	
MultiValve + CABG	MultiValve + CABG	
All		

The mortality outcome measures show procedure type operative mortality information

Domain	Participant					STS				
	Elig Proc	Est OR	95% CI	Percentile	Observ Rate	Est OR	Min-Max	10th	50th	90th
CABG In-hospital Mortality	1768	0.76	(0.51-1.11)	79.20%	1.24%	1.00	(0.34-4.57)	1.59	0.99	0.64
CABG Operative Mortality	1768	0.69	(0.49-0.98)	85.90%	1.53%	1.00	(0.33-3.98)	1.57	0.99	0.65
AVR Operative Mortality	308	0.74	(0.37-1.44)	95.40%	0.97%	1.00	(0.32-2.56)	1.29	0.97	0.80
MVR Operative Mortality	96	0.62	(0.29-1.29)	96.20%	2.08%	1.00	(0.37-2.58)	1.39	0.97	0.75
MV Repair Operative Mortality	204	0.81	(0.36-1.83)	96.10%	0.49%	1.00	(0.40-2.04)	1.22	0.98	0.89
AVRCABG Operative Mortality	125	0.72	(0.36-1.45)	95.30%	1.60%	1.00	(0.44-2.04)	1.30	0.98	0.79
MVRCABG Operative Mortality	27	0.63	(0.28-1.41)	98.80%	0.00%	1.00	(0.41-2.48)	1.28	0.97	0.79
MV Repair+CABG Operative Mortality	27	1.14	(0.46-2.84)	19.50%	7.41%	1.00	(0.51-2.36)	1.31	0.97	0.83
MultiV Operative Mortality	63	0.60	(0.27-1.33)	97.80%	3.17%	1.00	(0.41-2.52)	1.31	0.97	0.77

Mortality Outcome Measures:

- The column labeled Eligible Procedures indicates the number of patients who met the inclusion criteria to be included in the analysis for the indicated measure.
- Participant Estimated Odds Ratio (OR)
- Bayesian Credible Intervals (CI) shows the range in which the participant's true score is likely to lie.
- The Participant Percentile is the percent of STS participants who have an estimated OR that is greater than or equal to your estimated OR
- The Observed Participant Rate is the percentage of eligible patients who experienced the specified outcome. Unlike the participant estimated OR, the observed participant rate is not risk-adjusted.
- The labels "Min" and "Max" denote the estimated lowest and highest participant scores, among all participants in the analysis.
- The 10th, 50th, and 90th percentiles of the distribution across participants.
    - 10th percentile: The value under which 10% of the individual values lie.
    - 50th percentile: The value under which 50% of the individual values lie.
    - 90th percentile: The value under which 90% of the individual values lie.

Data Analyses of The Society of Thoracic Surgeons

Participant: 99999

STS Period Ending Sep 2024

Quality Ratings

- CABG
- AVR
- AVR + CABG
- MVRR
- MVRR + CABG

Quality Rating Details

- CABG
- AVR
- AVR + CABG
- MVRR
- MVRR + CABG

Rating Trends

- Rating Trends

Process and Outcome Measures

- CABG Process Measures
- CABG Outcome Measures
- All Cardiac Surgeries Process Measures
- Mortality Outcome Measures

Risk Adjusted and Regional Outcomes

- Isolated CABG
- Isolated CABG - Subset: On Pump Procedures
- Isolated CABG - Subset: Off Pump Procedures
- Isolated CABG - Subset: First Operations
- Isolated CABG - Subset: Reoperations
- Isolated Aortic Valve Replacement
- Isolated Aortic Valve Replacement + CABG
- Isolated Mitral Valve Replacement
- Isolated Mitral Valve Replacement + CABG
- Isolated Mitral Valve Repair
- Isolated Mitral Valve Repair + CABG
- Multivalve
- MultiValve + CABG
- All

Benchmark Reports

- Isolated CABG
- Isolated CABG - Subset: On Pump Procedures
- Isolated CABG - Subset: Off Pump Procedures
- Isolated CABG - Subset: First Operations
- Isolated CABG - Subset: Reoperations
- Isolated Aortic Valve Replacement
- Isolated Aortic Valve Replacement + CABG
- Isolated Mitral Valve Replacement
- Isolated Mitral Valve Replacement + CABG
- Isolated Mitral Valve Repair
- Isolated Mitral Valve Repair + CABG
- Multivalve
- MultiValve + CABG

Anesthesia Report

- Anesthesia - CABG Procedures
- Anesthesia - Valve Procedures

The Society of Thoracic Surgeons

Isolated CABG Procedure Risk-Adjusted Data Summary

Participant: 99999

STS Period Ending Sep 2024

Mortality Risk-Adjustment

Outcome		My Site 2022	My Site 2023	My Site 2024*	Like Group 2024	Region 2024	STS 2024
In-hospital Mortality	OR (95% CI)	0.91 (0.53-1.57)	0.73 (0.42-1.29)	0.85 (0.42-1.74)	1.04 (0.91-1.20)	0.90 (0.73-1.10)	1.00
	O/E (95% CI)	0.90 (0.46-1.61)	0.65 (0.29-1.30)	0.64 (0.17-1.84)	0.94 (0.86-1.04)	0.88 (0.70-1.10)	1.00
	Risk-adjusted Rate (95% CI)	1.65%	1.06%	0.98% (0.25-2.82)	1.44% (1.32-1.59)	1.35% (1.07-1.69)	1.53%
	Observed Rate	-	-	-	1.46%	1.34%	1.52%
Operative Mortality	OR (95% CI)	0.84 (0.51-1.38)	0.65 (0.39-1.10)	0.89 (0.47-1.66)	1.07 (0.94-1.21)	0.86 (0.71-1.04)	1.00
	O/E (95% CI)	0.82 (0.45-1.40)	0.55 (0.26-1.06)	0.79 (0.29-1.81)	0.94 (0.87-1.01)	0.85 (0.70-1.03)	0.99
	Risk-adjusted Rate (95% CI)	1.98%	1.21%	1.63% (0.60-3.74)	1.94% (1.79-2.10)	1.76% (1.44-2.14)	2.06%
	Observed Rate	-	-	-	1.94%	1.75%	2.03%

Complications Risk-Adjustment

Outcome		My Site 2022	My Site 2023	My Site 2024*	Like Group 2024	Region 2024	STS 2024
Deep Sternal Infection / Mediastinitis	OR (95% CI)	0.59 (0.17-2.09)	0.89 (0.29-2.74)	1.12 (0.32-3.90)	0.87 (0.65-1.16)	1.17 (0.74-1.84)	1.00
	O/E (95% CI)	0.00 (0.00-2.31)	0.64 (0.03-3.61)	1.19 (0.06-6.64)	0.88 (0.69-1.12)	1.31 (0.79-2.09)	1.00
	Risk-adjusted Rate (95% CI)	0.00%	0.17%	0.29% (0.02-1.63)	0.22% (0.17-0.28)	0.32% (0.19-0.51)	0.25%
	Observed Rate	-	-	-	0.21%	0.31%	0.24%
Major Complications or Op. Mortality	OR (95% CI)	0.72 (0.54-0.97)	0.49 (0.35-0.68)	0.61 (0.41-0.90)	0.97 (0.90-1.06)	0.86 (0.78-0.96)	1.00
	O/E (95% CI)	0.76 (0.57-0.99)	0.49 (0.34-0.68)	0.54 (0.33-0.85)	0.95 (0.92-0.99)	0.88 (0.81-0.96)	1.00
	Risk-adjusted Rate (95% CI)	7.71%	4.60%	4.98% (3.04-7.76)	8.65% (8.41-9.01)	8.04% (7.36-8.77)	9.15%
	Observed Rate	-	-	-	8.72%	8.01%	9.09%
Permanent Stroke	OR (95% CI)	0.79 (0.45-1.40)	0.76 (0.46-1.28)	0.79 (0.47-1.34)	1.00 (0.89-1.13)	1.00 (0.89-1.13)	1.00
	O/E (95% CI)	0.63 (0.23-1.45)	0.48 (0.15-1.22)	0.22 (0.01-1.25)	1.00 (0.91-1.10)	0.99 (0.78-1.25)	1.00
	Risk-adjusted Rate (95% CI)	0.85%	0.61%	0.29% (0.02-1.64)	1.32% (1.19-1.45)	1.30% (1.02-1.64)	1.31%
	Observed Rate	-	-	-	1.32%	1.29%	1.30%

Length of Stay Risk-Adjustment

Outcome		My Site 2022	My Site 2023	My Site 2024*	Like Group 2024	Region 2024	STS 2024
Length of Stay: Long Stay (PLOS > 14 Days)	OR (95% CI)	0.54 (0.35-0.82)	0.47 (0.30-0.73)	0.54 (0.31-0.92)	0.83 (0.74-0.92)	0.77 (0.67-0.88)	1.00
	O/E (95% CI)	0.50 (0.30-0.79)	0.39 (0.23-0.64)	0.39 (0.17-0.78)	0.88 (0.85-0.94)	0.74 (0.65-0.84)	1.00
	Risk-adjusted Rate (95% CI)	2.79%	2.12%	2.12% (0.93-4.27)	4.81% (4.62-5.10)	4.04% (3.55-4.59)	5.44%
	Observed Rate	-	-	-	4.84%	4.04%	5.40%
Length of Stay: Short Stay (PLOS < 6 Days)	OR (95% CI)	3.02 (2.49-3.68)	3.71 (3.06-4.49)	2.91 (2.30-3.67)	1.21 (1.05-1.39)	1.37 (1.24-1.52)	1.00
	O/E (95% CI)	1.46 (1.38-1.53)	1.54 (1.46-1.60)	1.43 (1.34-1.51)	1.06 (1.04-1.07)	1.17 (1.14-1.20)	1.00
	Risk-adjusted Rate (95% CI)	67.74%	72.34%	66.58% (62.52-70.20)	49.28% (48.57-49.63)	54.50% (53.24-55.74)	46.52%
	Observed Rate	-	-	-	49.03%	54.40%	46.22%
Post Procedure Length of Stay	Mean	-	-	-	6.85	6.40	7.06

Risk Adjusted and Regional Outcomes:

- My Site
- Like Group: The Like Group is a comparison group of STS participants that are most similar to the report participant with respect to annual site case volume and presence or absence of a surgical residency program*
- Participant's Region: For most participants, the region is the state or province in which they are located
- The STS mean participant score is the average of all scores across all the participants

Like Group: The Like Group is a comparison group of STS participants that are most similar to the report participant with respect to annual site case volume and presence or absence of a surgical residency program.

- **A participant is considered to have a surgical residency program if at least one of the hospitals for which data was submitted has a known residency program**

- **Participants located outside of the United States are not considered to have a residency program.**

- **Like Groups are determined following each harvest.**
  - **For each participant two Like Groups are created.**
    - **The CABG Like Group is based on the participant's CABG procedure volume**
    - **The Valve Like Group is based on the participant's valve procedure volume**

Table 2: Like Group Determination

	Annualized Procedure Volume	Surgical Residency*
CABG Like Groups		
	0-199 (low)	No
	0-199 (low)	Yes
	200-399 (moderate)	No
	200-399 (moderate)	Yes
	400+ (high)	No
	400+ (high)	Yes
Valve Like Groups		
	0-49 (low)	No
	0-49 (low)	Yes
	50-119 (moderate)	No
	50-119 (moderate)	Yes
	120+ (high)	No
	120+ (high)	Yes

Participant's Region: Participant data are compared to regional benchmark data in the Regional Outcomes Comparison section. For most participants, the region is the state or province in which they are located. However, for states and provinces that do not contain enough participants to provide a meaningful comparison group, the region is defined according to Table 3. Regions (derived from the Dartmouth Atlas of Health Care).

Table 3: Regions

Region	States / Provinces
New England	Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont
Middle Atlantic	New Jersey, New York, Pennsylvania
South Atlantic	Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia
Great Lakes	Illinois, Indiana, Michigan, Ohio, Wisconsin
East South Central	Alabama, Kentucky, Mississippi, Tennessee
Great Plains	Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota
West South Central	Arkansas, Louisiana, Oklahoma, Texas
Mountain	Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming
Pacific	Alaska, California, Hawaii, Oregon, Washington
Canada	Alberta, British Columbia, Manitoba, Nova Scotia, New Brunswick, Ontario, Quebec

Risk-Adjusted Summary Statistics

The STS report uses two types of summary statistics to present risk-adjusted results:

- **Observed to Expected (O/E) Ratios**
- **Model-based Odds Ratio (OR) estimates.**

Because each of these statistics has advantages, STS has decided to provide both in the report. The interpretations of the Odds Ratio and O/E Ratio are similar. It is the method of estimating these quantities that differs.

O/E Ratio

The O/E Ratio is the ratio of a participant's number (or percent) of observed outcome events relative to the number (or percent) of outcome events that is expected (predicted) by the STS risk-adjustment model, based on the participant's case mix.

Estimated Odds Ratio

The other main summary statistic, the estimated Odds Ratio, is obtained by fitting a set of hierarchical logistic regression models to the harvested data.

Mortality Risk-Adjustment

Outcome		My Site 2021	My Site 2022	My Site 2023	Like Group 2023	Region 2023	STS 2023
In-hospital Mortality	OR (95% CI)	1.43 (0.84-2.44)	0.46 (0.22-0.97)	1.19 (0.69-2.04)	0.88 (0.72-1.07)	0.81 (0.70-0.94)	1.00
	O/E (95% CI)	1.57 (0.86-2.65)	0.13 (0.01-0.74)	1.25 (0.64-2.24)	0.75 (0.66-0.86)	0.84 (0.74-0.96)	1.00
	Risk-adjusted Rate (95% CI)	2.95%	0.25%	2.01% (1.03-3.61)	1.21% (1.06-1.39)	1.36% (1.19-1.55)	1.61%
	Observed Rate	[illegible]	0.28%	2.15%	1.12%	[illegible]	1.57%
Operative Mortality	OR (95% CI)	[illegible].65 (0.35-1.20)		1.07 (0.65-1.76)	0.88 (0.73-1.05)	0.90 (0.79-1.04)	1.00
	O/E (95% CI)	1.38 (0.80-2.25)	0.52 (0.19-1.16)	1.11 (0.61-1.89)	0.75 (0.67-0.84)	0.92 (0.83-1.03)	1.00
	Risk-adjusted Rate (95% CI)	3.44%	1.24%	2.41% (1.32-4.11)	1.64% (1.45-1.83)	2.01% (1.81-2.24)	2.17%
	Observed Rate	3.76%	1.42%	2.59%	1.52%	2.21%	2.14%

Odds Ratio

Observed/Expected Ratio

Risk-adjusted Rate

STS Event Rates

Comparison of O/E Ratio and Odds Ratio

- **OE Ratio: The benefit of O/E Ratios is that they are familiar to many surgeons and are simple to compute using an STS-certified software package.**
- **OR Ratio: The main benefit of Odds Ratios obtained from hierarchical models is that they provide a more reliable estimate of performance for hospitals with a small number of patients.**

O/E Ratio – The Simplified Version

Table 9: O/E Ratio Interpretations*

Statistic	Interpretation
O/E Ratio > 1	When the O/E Ratio is greater than 1, the participant had an observed outcome level that was greater than expected. The participant performed worse than expected.
O/E Ratio < 1	When the O/E Ratio is less than 1, the participant had an observed outcome level that was less than expected. The participant performed better than expected.
O/E Ratio = 1	When the O/E Ratio is 1, the participant had an observed outcome level equal to expected. The participant performed as expected.

*The interpretations in this table can also be roughly extended to Odds Ratios- values less than 1 imply better than average performance, values of 1 imply average performance and values over 1 imply worse than average performance. Note that the Odds Ratio will generally be closer to 1.0 than the O/E Ratio. It is possible that these two measures will be discrepant, but only if they are close to 1.0.

** O/E > 1 (better than expected) and O/E <1 (worse than expected) in case of positive outcome measures (short LOS)

The Odds Ratio supplied in the STS participant report cannot be calculated by participants. The Odds Ratio is calculated using a hierarchical analysis technique that uses data on all STS participants. For this reason, the participant report generated by STS is the only resource containing the Odds Ratio.

Understanding Risk Adjustment - The Simplified Version

Statistic	Interpretation
Risk-adjusted rate > STS event rate	When the risk-adjusted rate for a particular adverse outcome is greater than the STS average rate, then the participant had more of those outcomes than expected given their case-mix.
Risk-adjusted rate < STS event rate	When the risk-adjusted rate for a particular adverse outcome is less than the STS average rate, then the participant had less of those outcomes than expected given their case-mix.
Risk-adjusted rate = STS event rate	When the risk-adjusted rate for a particular adverse outcome is equal to the STS average rate, then the participant had the same number of those outcomes as expected given their case-mix.

Data Analyses of The Society of Thoracic Surgeons

Participant: 99999

STS Period Ending Sep 2024

Quality Ratings	Quality Rating Details	Rating Trends	Process and Outcome Measures
CABG	CABG	Rating Trends	CABG Process Measures
AVR	AVR		CABG Outcome Measures
AVR + CABG	AVR + CABG		All Cardiac Surgeries Process Measures
MVRR	MVRR		Mortality Outcome Measures
MVRR + CABG	MVRR + CABG		

Risk Adjusted and Regional Outcomes	Benchmark Reports	Anesthesia Report
Isolated CABG	Isolated CABG	Anesthesia - CABG Procedures
Isolated CABG - Subset: On Pump Procedures	Isolated CABG - Subset: On Pump Procedures	Anesthesia - Valve Procedures
Isolated CABG - Subset: Off Pump Procedures	Isolated CABG - Subset: Off Pump Procedures	
Isolated CABG - Subset: First Operations	Isolated CABG - Subset: First Operations	
Isolated CABG - Subset: Reoperations	Isolated CABG - Subset: Reoperations	
Isolated Aortic Valve Replacement	Isolated Aortic Valve Replacement	
Isolated Aortic Valve Replacement + CABG	Isolated Aortic Valve Replacement + CABG	
Isolated Mitral Valve Replacement	Isolated Mitral Valve Replacement	
Isolated Mitral Valve Replacement + CABG	Isolated Mitral Valve Replacement + CABG	
Isolated Mitral Valve Repair	Isolated Mitral Valve Repair	
Isolated Mitral Valve Repair + CABG	Isolated Mitral Valve Repair + CABG	
Multivalve	Multivalve	
MultiValve + CABG	MultiValve + CABG	
All		

Benchmarked Reports

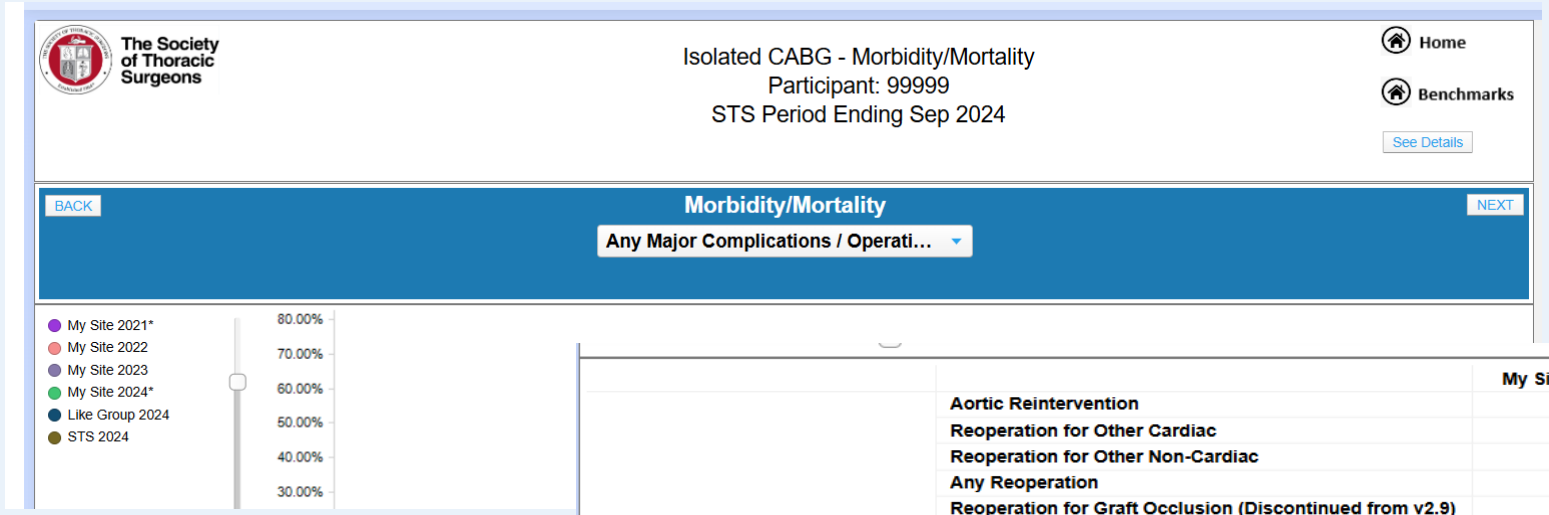
This section contains:

- The Participants non-risk adjusted analyzed data
- A like-participant comparison group
- The overall STS for the following procedure classifications.

  Isolated Coronary Artery Bypass (CABG)
  Isolated Aortic Valve Replacement (AV Replace)
  Aortic Valve Replacement + CABG (AV Replace + CABG)
  Isolated Mitral Valve Replacement (MV Replace)
  Mitral Valve Replacement + CABG (MV Replace + CABG)
  Isolated Mitral Valve Repair (MV Repair)
  Mitral Valve Repair + CABG (MV Repair + CAB)
  Multi-valve (AV Replace + MV Replace/Repair)
  Multi-valve + CABG (AV Replace + MV Replace/Repair + CABG)

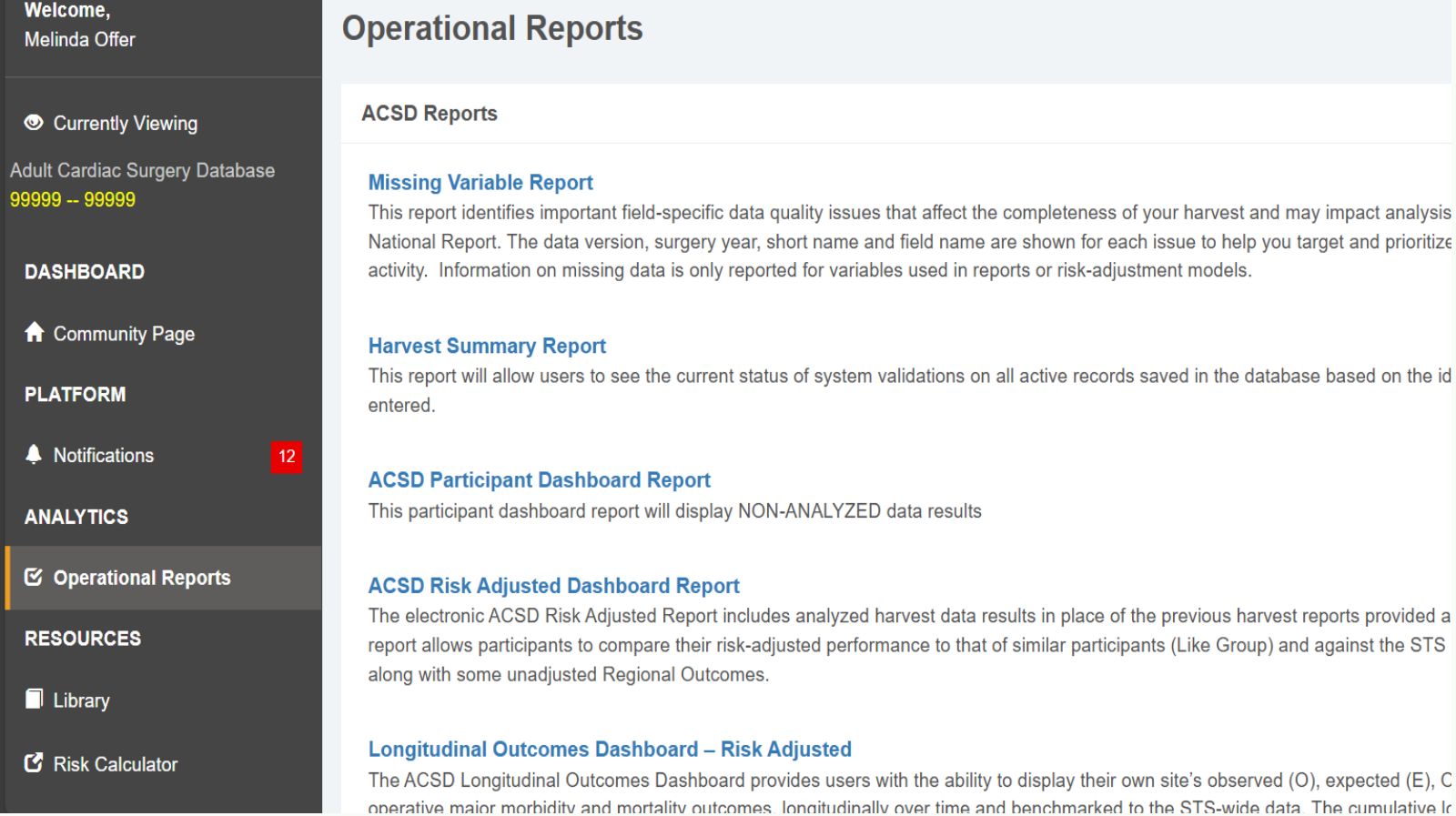
Note: CABG data are also stratified into the following subsets: On-Pump, Off-Pump, First Operation, Reoperation.

Benchmarked Reports



Notice the Next button to tab forward throughout the Benchmark report

		My Site 2021*	My Site 2022	My Site 2023	My Site 2024*	Like Group 2024	STS 2024
	Aortic Reintervention	-	-	-	-	0%	0.01%
	Reoperation for Other Cardiac	-	-	-	-	0.45%	0.50%
	Reoperation for Other Non-Cardiac	-	-	-	-	1.15%	1.26%
	Any Reoperation	-	-	-	-	3.28%	3.56%
	Reoperation for Graft Occlusion (Discontinued from v2.9)	-	-	-	-	-	-
Infection Complications	Any Infection	-	-	-	-	2.44%	2.69%
	Deep Sternal Infection/Mediastinitis	-	-	-	-	0.21%	0.24%
	Septicemia/Sepsis	-	-	-	-	0.69%	0.74%
	Conduit Harvest or Cannulation Site	-	-	-	-	0.40%	0.46%
Neurological Complications	Encephalopathy	-	-	-	-	1.07%	1.04%
	Transient Ischemic Attack	-	-	-	-	-	-
	Paralysis	-	-	-	-	0%	0.01%
	Coma (Discontinued from v4.20.2)	-	-	-	-	-	-
	Postoperative Stroke	-	-	-	-	1.32%	1.30%
Pulmonary Complications	Prolonged Ventilation	-	-	-	-	5.17%	5.45%
	Pneumonia	-	-	-	-	2.03%	2.24%
	Pulmonary Thromboembolism	-	-	-	-	0.14%	0.18%
	Pleural Effusion Requiring Drainage	-	-	-	-	4%	3.88%
	Deep Venous Thrombosis	-	-	-	-	0.63%	0.62%
	Pneumothorax Requiring Intervention	-	-	-	-	1.44%	1.46%
	Venous Thromboembolism (Discontinued from v4.20.2)	-	-	-	-	-	-
Vascular Complications	Acute Limb Ischemia	-	-	-	-	0.24%	0.25%
Other Complications	New Onset Atrial Fibrillation	-	-	-	-	26.81%	26.90%
	Cardiac Arrest	-	-	-	-	1.57%	1.57%
	Anticoagulant Complication	-	-	-	-	0.11%	0.09%
	Tamponade	-	-	-	-	0.04%	0.04%
	Gastro-Intestinal Complication	-	-	-	-	2.72%	2.67%
	Multi-System Failure (Discontinued from v4.20.2)	-	-	-	-	-	-
	Recurrent Atrial Fibrillation	-	-	-	-	46.18%	42.53%
	Unplanned Coronary Artery Intervention	-	-	-	-	0.36%	0.44%
Mortality Summary	In-hospital Mortality	-	-	-	-	1.46%	1.52%
	Operative Mortality	-	-	-	-	1.94%	2.03%
Post-operative Dialysis	Yes	-	-	-	-	1.21%	1.35%



Longitudinal Outcomes Dashboard – Risk Adjusted

- The ACSD Longitudinal Outcomes Dashboard provides users with the ability to display their own site's O/E, and risk adjusted rates for all operative major morbidity and mortality outcomes, longitudinally over time and benchmarked to the STS-wide data.
- The cumulative longitudinal dataset option is updated after Harvest 1 and 3 analysis resulting in an increasing number of cases and the longest time period available for display.
- The 3-year Harvest periods corresponding to the risk adjusted reports are available to select, visualize and drilldown by users.

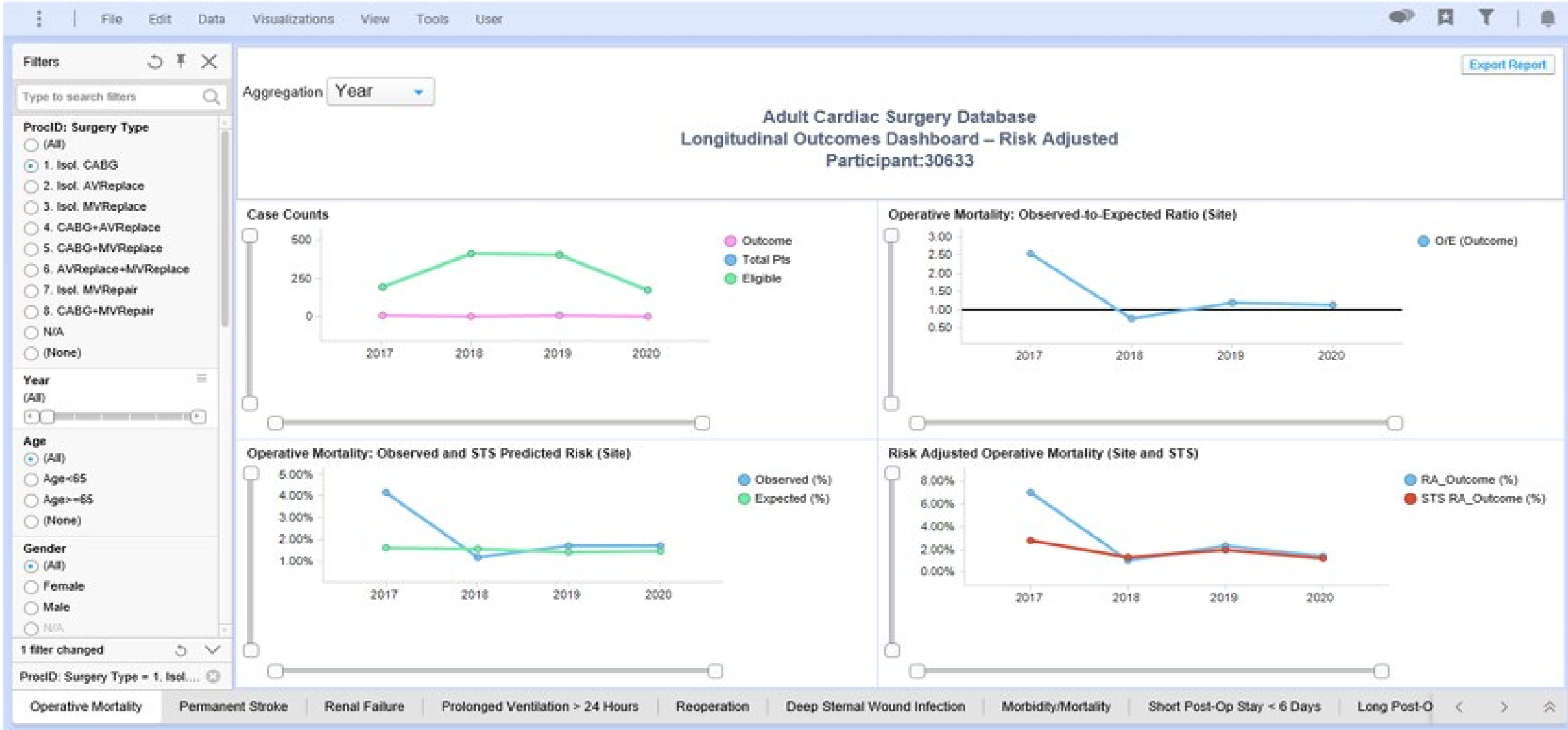
****Participants may see some differences between their estimated performance in the Risk Adjusted Dashboard Report and the Longitudinal Outcomes Dashboard-Risk Adjusted Report.**

- **The Risk-Adjusted Dashboard Report uses the fixed historical estimates of expected event probabilities based on the ACSD risk-adjustment models published in 2018.**
- **In comparison, the Longitudinal Outcomes Dashboard-Risk Adjusted updates these expected probabilities with every quarterly data harvest cycle.**
- **In the future, STS plans to migrate the Risk-Adjusted Dashboard Report to the dynamic risk-adjustment used in the Longitudinal Outcomes Dashboard-Risk Adjusted, but for now the two sets of OE ratios can deviate slightly.**

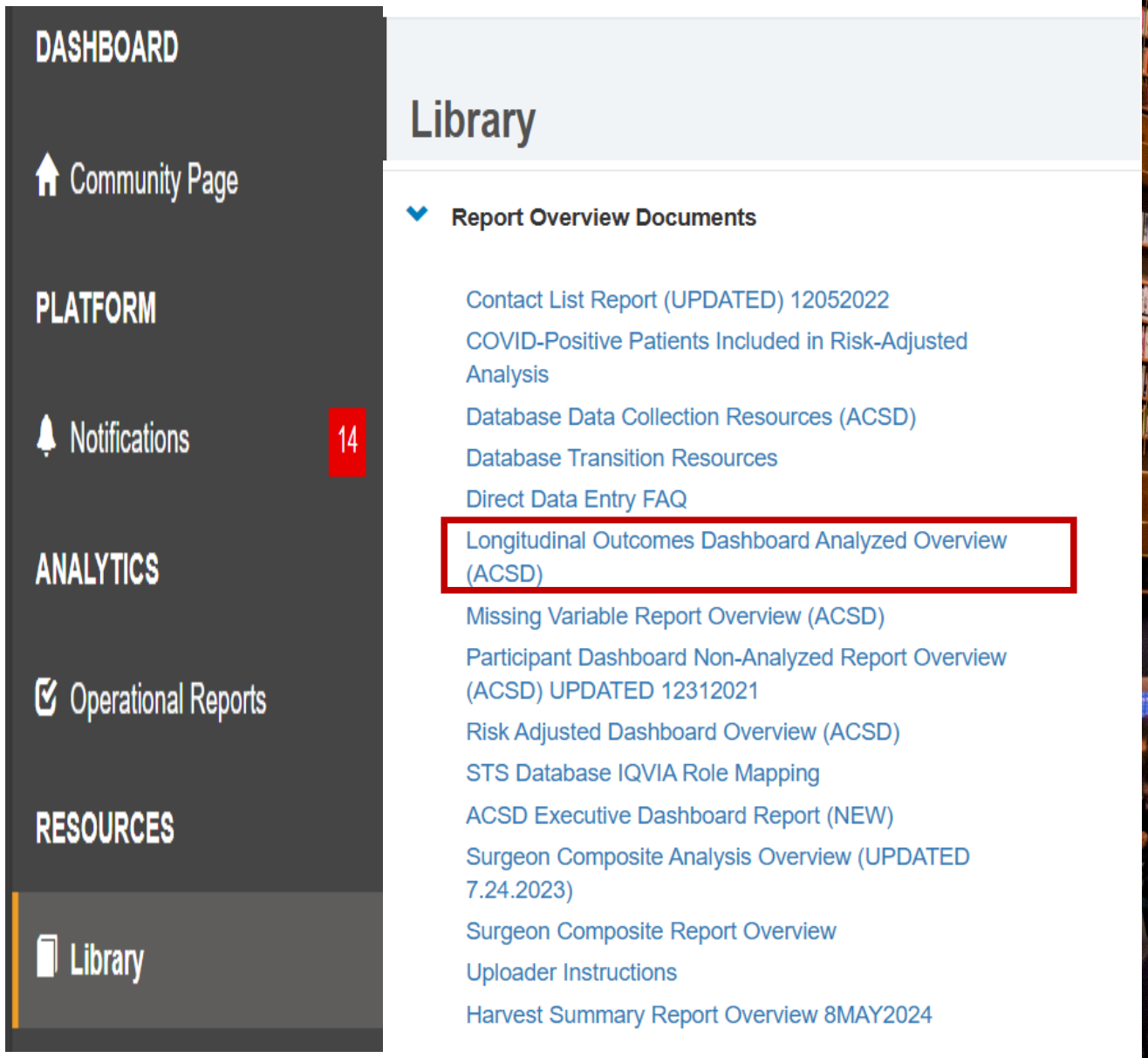
ACSD Reports

Longitudinal Outcomes Dashboard – Risk Adjusted

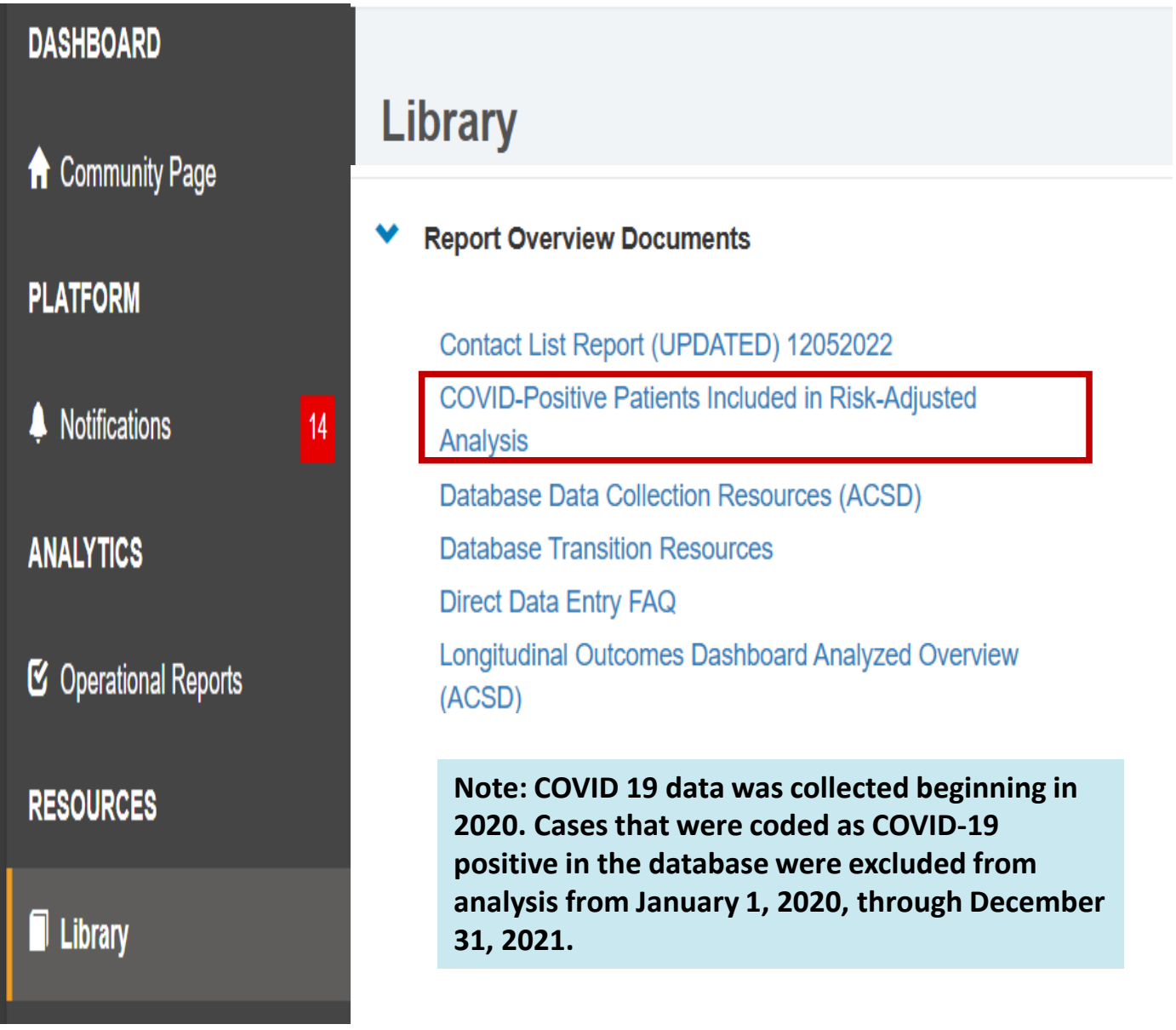
Example of Longitudinal Dashboard Reporting



IQVIA select the ‘Library’



IQVIA ‘Library’



Adult Cardiac Surgery Database

The ACSD data collection forms and training manual require a participant login. (*If you need assistance with your login credentials, contact STS Member services.*)

Access Data Collection Resources

- Sample Data Analysis Reports
- Adult Cardiac Multiplier Tables
- ACSD Harvest Deadlines
- Exceptional Risk Exclusion Request

Adult Cardiac Multiplier Tables

- ACSD 2024 Harvest 3 Multiplier Table
- ACSD 2024 Harvest 2 Multiplier Table
- ACSD 2024 Harvest 1 Multiplier Table
- ACSD 2023 Harvest 4 Multiplier Table
- ACSD 2023 Harvest 3 Multiplier Table
- ACSD 2023 Harvest 2 Multiplier Table
- ACSD 2023 Harvest 1 Multiplier Table
- ACSD 2022 Harvest 4 Multiplier Table
- ACSD 2022 Harvest 3 Multiplier Table
- ACSD 2022 Harvest 2 Multiplier Table
- ACSD 2022 Harvest 1 Multiplier Table
- ACSD 2021 Harvest 4 Multiplier Table
- ACSD 2021 Harvest 3 Multiplier Table
- ACSD 2021 Harvest 2 Multiplier Table
- ACSD 2021 Harvest 1 Multiplier Table

Multipliers are used to Guide to Risk Adjust your OE Locally

- **The O/E Ratio calibration multipliers for the most recent 3 years can be found on the website**
- **The choice of the appropriate O/E multiplier depends upon the time-period of the procedures for which the O/E Ratio has been calculated**
- **O/E = (percent observed events ÷ 'expected' percent events) x O/E Ratio re-calibration multiplier**

Table 1. Observed/Expected Ratio Multipliers for Recalibration

Procedure / Outcome	2022	2023	2024
Isolated CABG			
Operative Mortality	0.728	0.777	0.795
In-hospital Mortality	0.953	1.045	1.074
Morbidity: Permanent Stroke	0.869	0.913	0.857
Morbidity: Renal Failure	0.823	0.859	0.841
Morbidity: Prolonged Ventilation	1.192	1.258	1.293
Morbidity: Deep Sternal Wound Infection	0.757	0.843	0.934
Morbidity: Any Re-Operation	0.836	0.835	0.842
Morbidity: Combined Morbidity/Mortality Outcomes	1.105	1.153	1.174
Morbidity: PLOS > 14 days	0.808	0.822	0.804
Morbidity: PLOS < 6 days	1.066	1.059	1.072
Isolated AV Replacement			
Operative Mortality	0.807	0.884	0.926
In-hospital Mortality	1.072	1.193	1.154

Guide to Risk Adjust your OE Locally using Multipliers

Step 1: Find how many the model predicted?

- Run a query from your software to get the number of operative mortalities and the risk of operative mortality for each pts. in the model you are interested in
- Add up the probability (decimal form of risk of mortality) for all the patients.
- This is the expected number of deaths.

28	0.00838
29	0.00711
30	0.00721
31	0.01061
32	0.00669
33	0.02467
34	0.03451
35	0.01506
36	0.00455
37	0.01193
38	0.00685
39	0.02212
40	0.01039
41	3.2 is the sum of all these probabilities

Courtesy of Judy Smith, RN, BSN University of Virginia Health, Charlottesville, VA

Guide to Risk Adjust your OE Locally using Multipliers

Step 2 : find out how many events you had from your software

This site had 2 operative mortalities.

This is the “observed” rate.

Courtesy of Judy Smith, RN, BSN University of Virginia Health, Charlottesville, VA

Guide to Risk Adjust your OE Locally using Multipliers

Step 3: Calculate your Observed:Expected

- This site had 2 observed events and 3.2 predicted
- 2/3.2=0.625
- This is the un-recalibrated O:E.

Courtesy of Judy Smith, RN, BSN University of Virginia Health, Charlottesville, VA

Guide to Risk Adjust your OE Locally using Multipliers

Step 4: Find the multiplier from the multiplier table

Table 1. Observed/Expected Ratio Multipliers for Recalibration

Procedure / Outcome	2021	2022	2023
Isolated CABG			
Operative Mortality	0.734	0.728	0.781
In-hospital Mortality	0.969	0.952	1.055
Morbidity: Permanent Stroke	0.886	0.868	0.918
Morbidity: Renal Failure	0.817	0.824	0.867
Morbidity: Prolonged Ventilation	1.165	1.193	1.263
Morbidity: Deep Sternal Wound Infection	0.683	0.755	0.873
Morbidity: Any Re-Operation	0.833	0.836	0.838
Morbidity: Combined Morbidity/Mortality Outcomes	1.088	1.105	1.158
Morbidity: PLOS > 14 days	0.847	0.808	0.825
Morbidity: PLOS < 6 days	1.038	1.066	1.057

Courtesy of Judy Smith, RN, BSN University of Virginia Health, Charlottesville, VA

Guide to Risk Adjust your OE Locally using Multipliers

Step 5: Multiply the Raw O:E by the Multiplier

- **Observed/Expected times the multiplier=recalibrated O:E**

2 deaths observed /3.2 predicted by the risk model=0.625

- 0.625 (raw O:E) X 0.781 (multiplier)=0.488
- 0.488 is the recalibrated O:E and something close to that should be on our end of year report.

Courtesy of Judy Smith, RN, BSN University of Virginia Health, Charlottesville, VA

Data Manager Training Webinars

Session 1 – Tuesday Feb 25th at 12 pm CST – ACSD Educational Resources and Navigation of the STS Website (1.5 hr)

Session 2 – Tuesday March 4th at 12 pm CST - Overview of Data Specs, Software Specs, Risk Model Variables (2 hr)

Session 3 – Tuesday March 11th at 12 pm CST - Case Inclusion and Choosing the Index Procedure, PROC ID chart (1.5 hr)

Session 4 – Thursday March 20th at 12 pm CST - Harvesting your Data and the DQR report (1.5 hr)

Session 5 – Tuesday March 25th at 12 pm CST - National Report Overview and Process / Outcome Measures (1.5 hr)

Session 6 – Tuesday April 1st at 12 pm CST - Updating site forms, STS Helpdesk, and RedCap forms (1.5 hr)

Session 7 – Tuesday April 8th at 11 am CST - IQVIA Reporting Overview (1.5 hr)

ANY
Questions?