CCORP Audits

CCORP Audits

- Statute
  - California Health and Safety Code 128745 (e)
    For coronary artery bypass graft surgery reports and any other outcome reports for which auditing is appropriate, the office shall conduct periodic auditing of data at hospitals.
- Goals
  - Determine quality of coding of risk factors and outcomes.
  - Determine if over-coding or under-coding of risk factors affects hospital outlier status
  - Help hospitals to improve data quality so the best data possible is used for creating outcome reports
- Clinical Advisory Panel supports annual audits

CCORP Audits

- CCORP data have been audited each year since 2003
  - Most hospitals have been audited at least once
    - Exceptions include hospitals new to CCORP or hospitals with very low volume
  - Average number of audits = 3 since 2003
  - A few hospitals have been audited > 7 times
    - Usually based on outlier status or coding issues

CCORP Audits

- Process of selecting hospitals
  - Final data submitted to OSHPD by CCORP hospitals
    - Sample based on preliminary risk models
      - Mortality/stroke outliers “better” or “worse”
      - Near-outliers
      - Hospitals with potential coding problems
      - Random selection
- Process of selecting records
  - Proportional to iso- and non-iso CABG volume
  - Min. of 60 and max. of 140 cases per hospital
  - Include in-hospital deaths
  - Include post-operative strokes
  - Select patients proportional to predicted risk of death/post-op stroke
  - Include secondary records should a chart not be located or not be a CABG

CCORP Audits

- Prior to the audit
  - Email/Letter from OSHPD to hospital
    - Goes to primary and secondary data contacts
    - Let OSHPD know if contact for audit is different
  - Advance correspondence from audit team
    - Set date
    - Confirm information
      - Space and equipment needed
      - Access to all medical records
      - Staff availability
      - Data security
    - Hospital level security check for audit team
    - Directions, parking, etc…
  - Audit sample uploaded in CORC
  - Week before the audit correspondence from audit team
    - Confirm site visit and necessary resources

CCORP Audits

- Day of audit
  - Audit team arrives
  - Helps to have hospital IT available if needed to ensure they can login and have access to all records
  - Auditors abstract subset of CCORP data elements
  - Blind abstraction (a few exceptions)
    - If discrepancy in surgeon info, audit team will confirm with hospital
  - Helps to have staff available if needed to find specific chart information
  - Exit interview with audit team leader, if requested by hospital

CCORP Audits

- After audit
  - Audit team checks data and sends to OSHPD
  - OSHPD overwrites hospital-submitted data with audit data in most situations
    - Any pre-approved SHOCK or SALVAGE case will not change
    - Any post-op strokes the hospital did not report will be discussed with the hospital
    - Audit results sent to hospitals
      - OSHPD happy to discuss results
  - Revised data used for risk models and results in public reports

Sample Audit Results

Variable Agreement Summary per 2015 CCORP Data Audit for all Audited CABG Procedures
All Audited Hospitals

Audited Variable	Percent Agreement	Agreement Statistic
Categorical Risk Factor Variables		
Isolated CABG	99.0	0.96
In-Hospital Mortality Outcome	100.0	1.00
Gender	99.9	0.99
Status of Procedure	84.7	0.70
Peripheral Arterial Disease	89.7	0.58
Cerebrovascular Disease	89.2	0.70
Cerebrovascular Accident (CVA)	96.2	0.79
Cerebrovascular Accident Timing	95.9	0.78
Chronic Lung Disease (CLD)	77.2	0.34
Heart Failure	82.6	0.56
Myocardial Infarction (MI)	87.1	0.73
Myocardial Infarction Timing	79.5	0.70
NYHA Classification	54.3	0.27
NYHA Class IV	69.4	0.38
Coronary Artery Disease Known	99.0	0.35
Percent Native Stenosis Known	96.0	0.05
Left Main Disease	95.4	0.90
Cardiogenic Shock	98.6	0.63
Diabetes	95.1	0.90
Diabetes Control	80.5	0.67
Liver Disease	98.1	0.60
Arrhythmia	93.3	0.76
Cardiac Arrhythmia - Vtach/Vfib	97.4	0.67
Cardiac Arrhythmia - AFlutter	98.4	0.32
Cardiac Arrhythmia - Third Degree Heart Block	99.3	0.34
Cardiac Arrhythmia - AFib	91.8	0.66
PCI	95.2	0.87
Prior PCI Interval	94.7	0.86
Operative Incidence	99.3	0.92
Prior CABG	99.4	0.92
Prior Valve	99.8	0.90
Number of Diseased Vessels	82.6	0.60
Mitral Insufficiency	65.4	0.54
Resuscitation	99.5	0.39

CLD – 99 cases where hospitals coded SEVERE and auditors found NONE, MILD, MODERATE

NYHA Class IV – 135 cases where hospitals coded YES and auditors found NO or MISSING

% Native Stenosis Known – 76 cases where hospitals coded YES and auditors found NO

Liver Disease improved over 2014 audit (0.31)

Sample Audit Results

Variable Agreement Summary per 2015 CCORP Data Audit for all Audited CABG Procedures
All Audited Hospitals

Audited Variable	Percent Agreement	Agreement Statistic
MELD Score	76.2	0.82
Process and Outcome Variables		
IMA Use	98.6	0.94
IMA Use: Any IMA vs. No IMA	99.0	0.94
Complication: Permanent Stroke	98.7	0.76
Complication: Post-op Dialysis Requirement	99.0	0.76
Complication: Post-op AFib	87.6	0.67
Complication: Sternal Wound Infection	99.6	0.17
Complication: Prolonged Ventilation	95.0	0.79
Complication: Re-Operation for Bleed	99.6	0.90
Complication: Re-Intervention Graft Occlusion	99.9	0.66
Complication: Post-op Renal Failure	97.5	0.60
IMA Use and Absence of Death, Infection, Stroke, Graft Occlusion, Bleed, Dialysis Req, Prolonged Ventilation	95.0	0.86
Non-Isolated CABG Related Variables		
Infectious Endocarditis	99.5	0.90
Infectious Endocarditis Type *	100.0	1.00
Valve Procedure Done	88.7	0.53
Aortic Valve Done	98.6	0.56
Aortic Valve Procedure	99.6	1.00
Mitral Valve Done	96.8	0.24
Mitral Valve Procedure	94.6	0.89
Tricuspid Valve Done	99.7	NA
Tricuspid Valve Procedure	NA	NA
Pulmonic Valve Done	100.0	NA
Pulmonic Valve Procedure	NA	NA

IMA and most complications have good agreement. Note: Poor Sternal Wound could be due to 30 day timing.

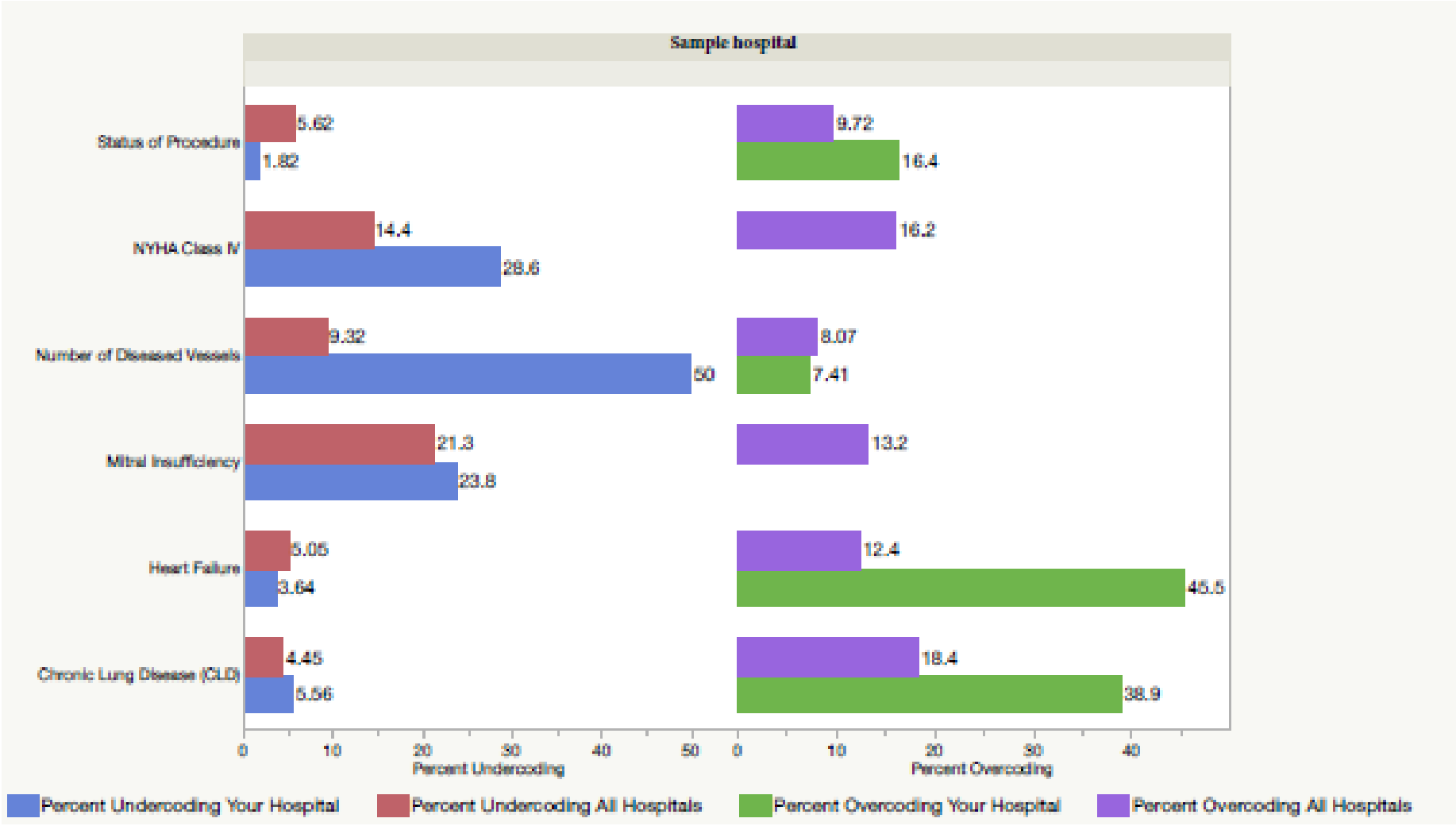
Mitral Valve – big discrepancy was between planned and unplanned

Your Hospital's Coding Quality Scores by Two Categories ALL CABG's (Isolated and Non Isolated) CCORP Audit 2015		
Risk Factor Coding	**Avg. Kappa**	**Avg. % Agreement**
Hospital A	0.798	92.14%
Hospital B	0.798	91.05%
Hospital C	0.796	90.94%
Hospital D	0.774	90.64%
Hospital E	0.770	93.39%
Hospital F	0.761	91.21%
Hospital G	0.745	90.54%
Hospital H	0.744	90.10%
Hospital I	0.739	90.32%
Hospital J	0.737	88.24%
Hospital K	0.729	88.74%
Hospital L	0.728	89.42%
Hospital M	0.725	86.94%
Hospital N	0.712	86.01%
Hospital O	0.711	87.62%
Hospital P	0.711	89.25%
ALL Audited Hospitals (using avg. of hospital avg.)	***0.701***	***88.08%***
Hospital Q	0.700	87.53%
Hospital R	0.694	89.82%
Hospital S	0.662	87.64%
Hospital T	0.656	85.24%
Hospital U	0.633	85.83%
Hospital V	0.632	84.76%
Hospital W	0.626	86.93%
Hospital X	0.620	83.95%
Hospital Y	0.589	83.19%
Hospital Z	0.585	83.31%
Hospital AA	0.563	83.38%

Your Hospital's Coding Quality Scores by Two Categories
ALL CABG's (Isolated and Non Isolated)
CCORP Audit 2015

Complications and IMA Coding	Avg. Kappa	Avg. % Agreement
Hospital A	0.970	99.85%
Hospital B	0.953	99.03%
Hospital C	0.920	98.79%
Hospital D	0.897	98.21%
Hospital E	0.893	98.09%
Hospital F	0.883	98.08%
Hospital G	0.881	97.84%
Hospital H	0.872	98.64%
Hospital I	0.866	98.80%
Hospital J	0.861	97.84%
Hospital K	0.861	98.24%
Hospital L	0.851	97.78%
Hospital M	0.850	97.62%
Hospital N	0.842	97.92%
Hospital O	0.842	98.62%
Hospital P	0.839	97.95%
Hospital Q	0.827	96.21%
Hospital R	0.815	98.25%
ALL Audited Hospitals (using avg. of hospital avg.)	**0.813**	**97.85%**
Hospital S	0.798	96.76%
Hospital T	0.785	96.88%
Hospital U	0.774	98.10%
Hospital V	0.749	97.56%
Hospital W	0.700	97.03%
Hospital X	0.637	96.53%
Hospital Y	0.630	97.93%
Hospital Z	0.627	96.82%
Hospital AA	0.537	96.59%

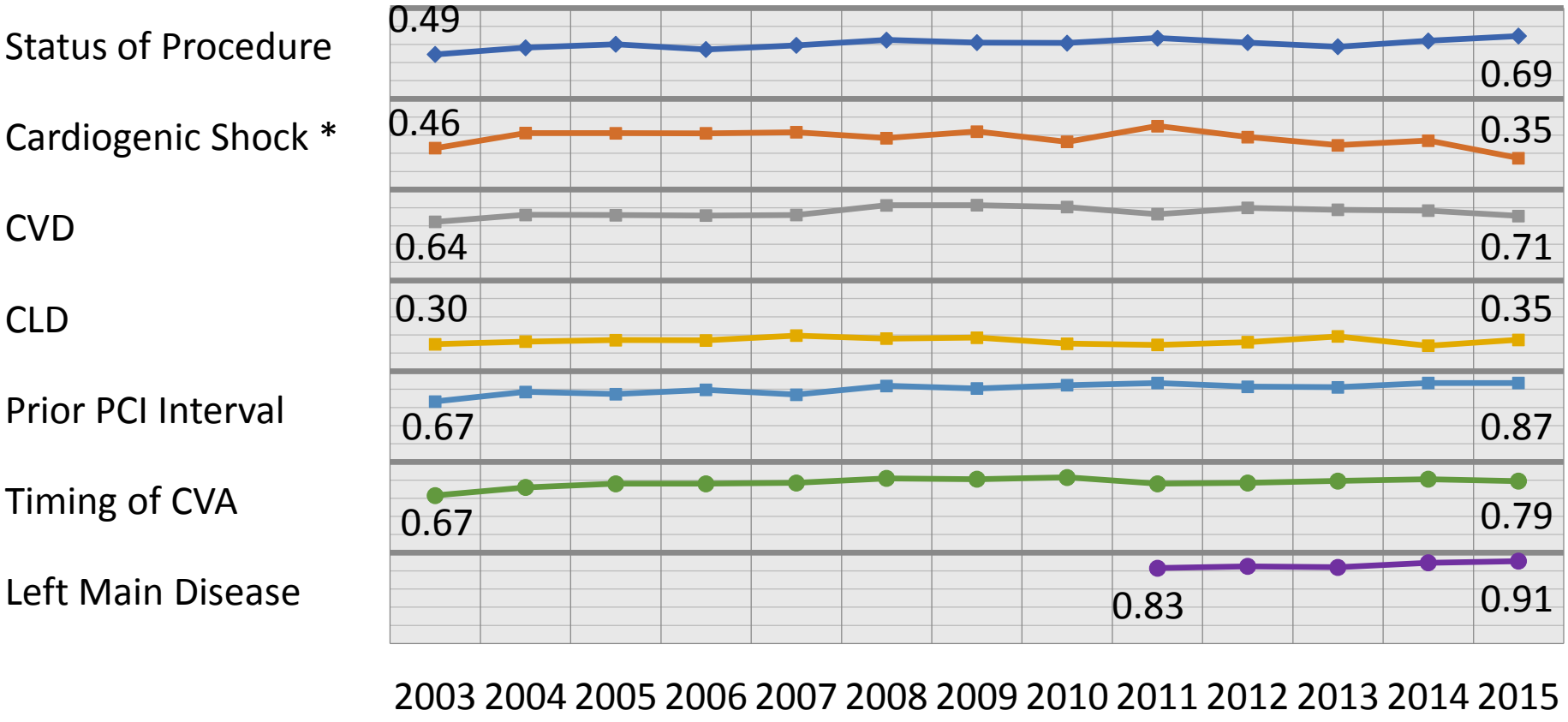
Sample Audit Results



OSHPD Office of Statewide Health Planning and Development

CCORP Audits 2003-2015

Trend in Kappa for Selected Risk Factors in Isolated CABGs

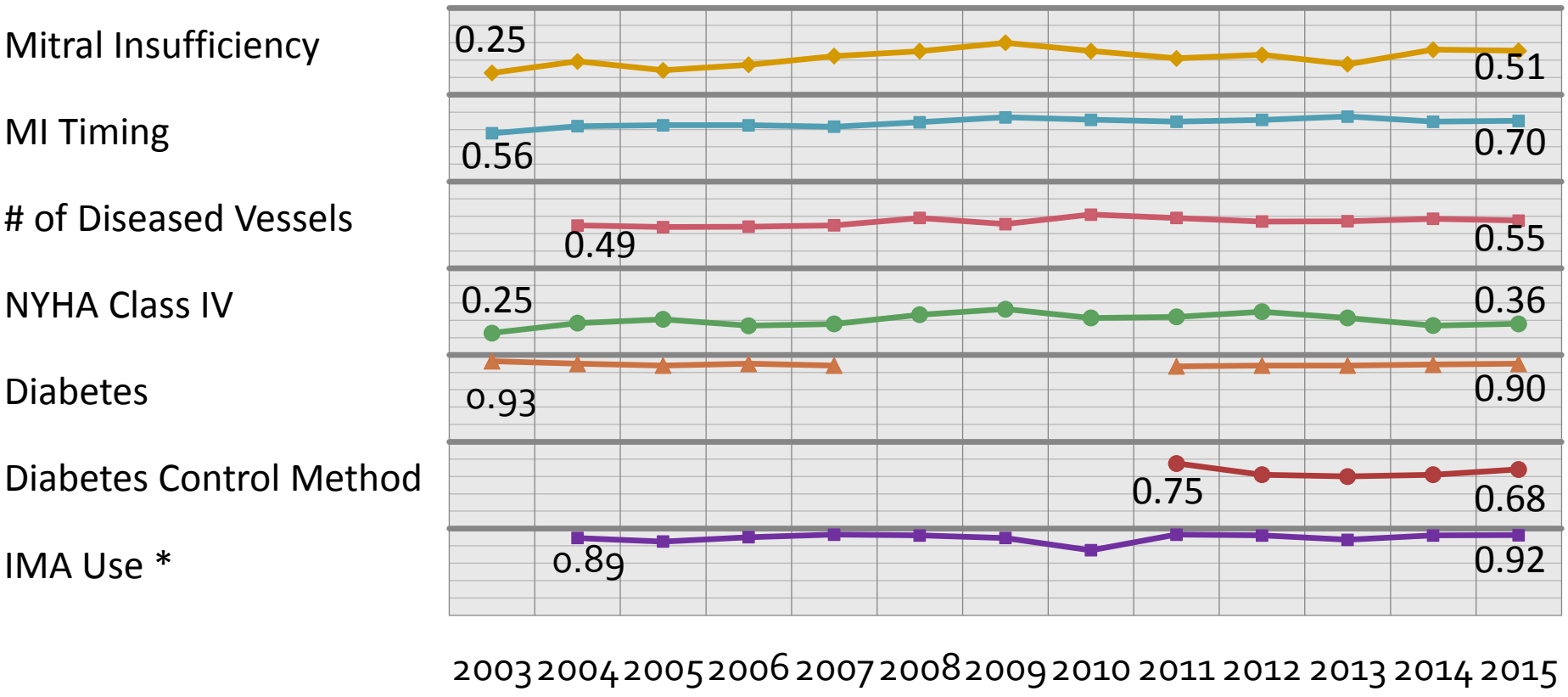


* All cardiogenic shock cases reported to CCORP are reviewed and confirmed by CCORP staff.

OSHPD Office of Statewide Health Planning and Development

CCORP Audits 2003-2015

Trend in Kappa for Selected Risk Factors in Isolated CABGs



* The kappa for *IMA use* is based on all levels collected for this variable (no IMA used, left IMA, right IMA, both IMAs used). The lower kappa in 2010 is a result of one hospital coding all their right IMAs as left IMAs. The 2010 kappa for the binary process measure *"IMA Used"* is 0.89.

OSHPD Office of Statewide Health Planning and Development

CCORP Audits

- Audits show coding of important risk factors has improved over time
- Still room for improvement in areas such as
  - Chronic Lung Disease
  - NYHA Class VI
  - Cardiac arrhythmia
- Results for 2016 audit will be out soon
- Audit of 2017 data will start in Sept. or Oct.

- Questions and Answers