First Annual Report

Cardiac Registry of Pakistan (CROP)
CathPCI Registry
Jan-Dec, 2017

FOREWORD

Dear Colleagues,
The American College of Cardiology (ACC), home to more than 52,000 cardiovascular practitioners worldwide, congratulates the launch of the first report from the Cardiac Registry of Pakistan (CROP) at Pakistan Live 2018 Conference and is privileged to offer our perspective on the importance of leveraging registries to track cardiovascular care globally.

Clinical data registries, like those that make up the ACC's NCDR registries, are an increasingly important means of tracking and assessing quality of care and outcomes associated with certain populations of patients with cardiovascular disease around the world. Registry data can also be used to perform cutting-edge health outcomes research and identify gaps in cardiovascular care.

The ACC launched its first NCDR clinical data registry – the CathPCI Registry – in 1998 to assess the characteristics, treatments and outcomes of cardiac disease patients receiving diagnostic catheterization and/or percutaneous coronary intervention (PCI) procedures. Since then, the number of registries has grown to 10 – eight hospital-based registries and two outpatient registries – with hospitals from around the world recognizing the robust nature and value of using data to drive quality improvement.

To date, registry data have been used to help reduce door-to-balloon (D2B) times for primary PCI; increase the percentage of ST-segment elevation myocardial infarction patients receiving timely reperfusion; control costs associated with preventable procedural complications; limit hospital readmissions; and more. registry data are also proving useful in terms of driving research, with hundreds of studies published in medical, peer-reviewed journals, including The Journal of the American College of Cardiology. Additionally, hospitals are using registry data to benchmark and compare their performance and identify opportunities to improve patient selection or adherence to guideline-recommended treatments.

Looking to the future, the ACC is committed to leveraging its NCDR data to create a collaborative global network to inform quality of care measurement and feedback, device surveillance, assessment of patient-centered outcomes, and more. As such, the College is excited by the opportunity to bring its ACTION Registry and Cath/PCI Registry to Pakistan. We are excited by the foresight and vision of the Pakistan Society of Interventional Cardiology and Pakistan Cardiac Society, in recognizing the importance of registries and databases, through participation in ACC's NCDR and in the development of the CROP database. We would also like to commend both societies for their commitment and dedication to understanding the importance of maintaining databases and starting the local registries for better quality patient care. Working together, we are another step closer to improving cardiovascular care and the lives of patients in Pakistan and around the world.

We are currently exploring how we can expand our collaborations to a broader set of hospitals in Pakistan through collaboration with the NCDR and CROP Cath PCI. ACC recognizes the need to engage local efforts in addition to expanding our global approach and looks forward to exploring opportunities to improve overall cardiovascular patient care and ensure better outcomes.

Congratulations on a very successful journey and thanks to all of the ACC members throughout Pakistan who allow us to achieve our worldwide mission of transforming cardiovascular care and improving heart health.

Sincerely,

C Michael Valentine

C. Michael Valentine, MD, FACC
President
American College of Cardiology

MESSAGE

It gives me tremendous pleasure to present to you the first yearly report of Cardiac Registry of Pakistan (CROP) – the CathPCI Registry. From start to launch of first report it has been a long and arduous but a very rewarding journey. A very well-known statistician and total quality guru of his time- Edwards Deming once said "In God we trust, all others must bring data". Clinical data registries are increasingly becoming a very important tool to improve overall patient care and health outcomes. Clinical data registries are not only helpful in assessing the quality of care and outcomes in cardiovascular disease but can also be used to identify and improve on the gaps in cardiovascular care and to perform health outcomes research in cardiovascular diseases.

Pakistan Society of Interventional Cardiology soon after its rejuvenation realized the importance of the CathPCI registry immediately and started making efforts to start the registry. Pakistan Cardiac Society was also taken on board along with Health Research Advisory Board (HealthRAB) – an NGO promoting health research in Pakistan. HealthRAB agreed to provide unconditional grants/logistic support for CROP- the CathPCI Registry. I am very happy to say that we were able to start the CathPCI Registry first time in Pakistan in 2016 and today we are able to present the first yearly report. It would not have been possible without the guidance and support of all Cardiology community of Pakistan and several other people involved in starting the registry.

Participation in CROP registry was stressed upon in cardiac catheterization laboratory (CCL) Standards and Best Practice Guidelines 2017, prepared by PSIC. Sixteen leading cardiac centers have already adopted CROP-the CathPCI Registry. Recently formulated national interventional cardiology board (NICB),in a written submission to supreme court of Pakistan, has also desired to adopt CROP. The operations and utilization of CROP shall be defined pursuant to the CROP terms and conditions. Further more Supreme Court has also endorsed the database requirement and all health care commissions, have agreed to make mandatory for the Cath. Labs. to adopt CROP – the CathPCI Registry.. Punjab Health Care commission has already accepted the concept of such national cardiac registry for Pakistan.

I would like to start by thanking Dr. Asad Pathan who on my perseverance, with the help of team from HealthRAB was able to develop the software similar to National Cardiovascular Database Registry (NCDR) managed by American College of Cardiology database) format and start the database at Tabba Heart Institute in 2012. My goal was to streamline the database entry so that it could be used online at other institutions across Pakistan to make it a national CathPCI Registry.

We planned to launch the registry nationwide in 2016 at Pakistan Live meeting in Lahore where all institutional representatives were briefed on the importance of starting the database/registry and asked to sign an memorandum of understanding (MoU) outlining the international standards terms of reference (TORs) for confidentiality and security of the CathPCI Registry. It was an herculean task to convince everyone to participate in CROP - the CathPCI Registry because of obvious and understandable apprehensions and concerns for confidentiality as well as security of the database.

Several meetings were held with all the institutional representatives to alleviate these concerns. Subsequently training programs were conducted in different cities and institutions to launch the database. Some of the institutes were very forthcoming. Here I would like to not only mention but appreciate and recognize Dr Ijaz Ahmed and his team for becoming the first institution after Tabba Heart Institute to very actively start participating in CROP – the CathPCI Registry. Subsequently other institutes from other provinces joined in and since then gradually and slowly the number of institutions taking part in CROP –the CathPCI registry has been increasing. International standards TORs and organizational structure has been developed for confidentiality and security of the database. I would use this opportunity to request and invite all the remaining major institutions to become active participants of CROP – the CathPCI Registry. I can assure you that the CROP- CathPCI registry data will be kept strictly confidential and will only be used to improve patient care and health outcomes research as per procedures laid down in terms of reference. I am sure next year's report will have many more institutions from all over the country involved.

I am very grateful to President, American College of Cardiology and NDCR team for their encouragement and recognition of CROP- the CathPCI Registry and for writing the foreword for this report. I would also like to thank HealthRAB for their unconditional support in providing the infrastructure and human resource in all the participating institutions, Dr. Zakiuddin- Secretary HealthRAB and Dr. Shahid Noor – Chairman Registry Committee, HealthRAB for their guidance, support and help and special thanks to Rehan Malik – Manager CROP, without whose untiring day and night efforts and help this would not have been possible.

Sincerely,

Dr. Bashir Hanif, MD, FACC, FSCAI
Director CROP

MESSAGE

It gives me immense pleasure to write about the 1st Annual Report of CROP which is the first of its kind national cardiology registry in Pakistan. We, at Health Research Advisory Board (HealthRAB), are striving to develop the research ecosystem of Pakistan and one of our main objective is to establish national registries in different specialties including, but not limited to, cardiology, diabetes, orthopedics, gastroenterology, etc. HealthRAB has provided logistical, technical and academic support to CROP and we aim to enhance this support in the coming years. We collectively made an effort to bring together all major stakeholders & institutions to create a truly national cardiac registry and we have been fairly successful in getting data from around the country.

HealthRAB is the only research organization in Pakistan which is a formal member of the "Research Committee' established by the federal ministry of national health services. This formal position allows us to bring credibility to all the national registries which work with our support.

In the end, I reiterate that we remain committed to the growth of CROP and will make all efforts to facilitate the inclusion of remaining cardiology institutions and centers to make it the largest and most inclusive cardiac registry of Pakistan.

Sincerely,

Dr. Zakiuddin Ahmed
Secretary, HealthRAB
Secretary, CROP

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LIST OF AUTHORS

Dr. Bashir Hanif , MD, FACC, FSCAI
Director, CROP
President, Pakistan Society of Interventional Cardiology
Executive Director, Tabba Heart Institute

Dr. Zakiuddin Ahmed
Secretary, HealthRAB
Secretary, CROP

Rehan Malik
Manager, CROP
Registry Site Manager, NCDR-ACC

EXECUTIVE SUMMARY

Cardiac Registry of Pakistan (CROP) is a voluntary project of Pakistan Society of Interventional Cardiology (PSIC) along with Pakistan Cardiac Society, and Health Research Advisory Board (HRAB). This is the first time that a cardiac registry is being initiated in Pakistan. There have been multiple challenges faced in the development of the registry in a resource limited country. CROP- the CathPCI registry is designed to contribute to quality care and safety of cardiovascular disease patients in the country undergoing coronary angiography & angioplasty. Through this registry hospitals and physicians shall be able to retrieve national data for outcomes, research and form guidelines on implant use based on national consensus.

Regisrty Update Meeting

INTRODUCTION TO REGISTRY

Registry is an important research tool for any clinician. Registries can help practice in number of ways. Following are some FAQs that help describe what registries are.

Why are registries needed?

Registries can provide health care professionals and researchers with first-hand information about people and certain conditions, both individually and as a group, and over time, to increase our understanding of that condition. Some registries collect information that can be used to track trends about number if people with diseases, treatment and more. Other registries invites people to sign up to be contacted about participating in clinical research. These ask very basic questions about heath history that would help determine whether some is possibly eligible to join a research study.

Is sounds like these registries collect personal health information. Is there a risk that such information could be disclosed?

Government agencies have strict privacy requirements set by law such as the Federal Information Security Management Act (FISMA), and the Health Insurance Portability and Accountability (HIPAA). If registries have followed all these rules, the likelihood of identifiable personal information being shared is very small.

What benefits will some receive from participating in a registry?

Participation in a registry is likely to increase what we know about a specific condition, help health care professionals improve treatment, and allow researchers to design better studies on a particular conditions, including development and testing of new treatments. Being part of a clinical trial registry can help people interest4ed in participating in research connect with clinical investigators? However, individual (and their families) who choose to participate in registry should understand that participation will not guarantee a treatment or cure for their condition or that they will be eligible to join the study.

Who has the access to the information in a registry?

Usually, a federal funded register has a very limited list of individuals (registry coordinator) who may access to participants personal, identifying information. Those individual's must be specially trained and certified regarding information security requirements.

Who owns the data from a registry? Who makes decisions about how these data will be used?

The data collected in a disease registry is stripped of personal information, it belongs to the sponsor of the registry, and depending on how the registry is set up, may be shared with participant and their families, and approved heath care professionals and researchers. However, personal, identifying information is kept private usually, a registry has a governing committee that makes decisions about how the data can be used or shared.

Can a participant withdraw from the registry?

Yes, registries are free and voluntary; there is no penalty for choosing to withdraw at any point.

Who should the participant contact with additional question or concern?

For any questions about participation or any issues that may arise, registries provide a contact, usually the registry coordinator.

How is a registry different from a clinical trial?

Registries focused on specific diseases or conditions collect information voluntarily from people with those conditions. Clinical trials registries collect basic health information from people who agree to be contacted about participating in future clinical trials or studies. A clinical trial is the study of new ways to prevent, detect or treat diseases or conditions. Volunteering for a registry does not mean a person has signed up for a clinical trial. Participation in a disease registry can sometimes become a first step towards participation in a clinical trial, but registries and specific trails are not directly linked.

What are the standards for Data Registries?

1. Develop a formal study protocol.
2. Measure outcomes that people in the population interest notice and care about.
3. Describe data linkage plan, if applicable.
4. Plan follow up bases on registry objective(s).
5. Describe data safety and security.
6. Take appropriate steps to ensure data quality.
7. Document and explain any modifications to protocol.
8. Collect data consistently.
9. Enroll and follow patients systemically.
10. Monitor and take actions to keep loss to follow up to an acceptable minimum.
11. Use appropriate statistical techniques to address confounding.

Who are the types of national registries?

1. Patient organization registries.
2. Medical registries.
3. Health ministry registries.
4. Mixed system.

What are the step in establishing a national patient registry?

1. Organize a registry committee.
2. Establish goals of registry.
3. Prepare your action plan.
4. Select the system of data collection.
5. Determine the data content.
6. Design the data collection form.
7. Collect the data.
8. Analyze the data.
9. Review the registry system
10. Maintaining and using a national registry.

Prof. Dr. Syed Shahid Noor
President, PoA
Director, Pakistan National Registry
Chairman Registry Committee, HealthRAB

INTRODUCTION TO CROP

Cardiac Registry Of Pakistan

C.R.O.P

CROP INTRODUCTION

Cardiac Registry of Pakistan (CROP) is the first of its kind national cardiology registry of Pakistan with the purpose to serve healthcare providers in the specialty of cardiology.

CROP is an initiative of Pakistan Society of Interventional Cardiology (PSIC) in collaboration with Pakistan Cardiac Society and HealthRAB which was approved by all the stakeholers at a meeting held in PC Hotel in Karachi in 2015.

Objective of CROP

The main objective of the national cardiac registry are:

1.To improve the quality of cardiac care in Pakistan

2. To make national guidelines as per our population characteristics and demographics

3. To develop quality measures tool from the national data

4. To publish cardiac research from this national database

Several CROP registries are being planned including the following:

1. The CathPCI Registry
2. Heart Failure Registry
3. ACS Registry
4. Cardiac Devices Registry

CROP –The CathPCI Registry:

The CathPCI Registry is the first one that has already been initiated. The first and most important requirement for CROP- the CathPCI Registry is to sign the Memorandum of Understanding (MoU) that outlines the terms of reference and guidelines based on international standards. The following steps will follow after signing MoU

1. Staff Training
2. ID assignment
3. Online Data submission
4. Quarterly Online Reports of your institution benchmarked with rest of the institutions in the country.

Benefits by participating in the CROP- The CathPCI Registry:

All participating instituions will be provided with:

1. Online data entry tool for each registry
1. Resources and training to the staff to guide participant's data collection activities.
3. Quarterly online report on AUC, DTB, predicated In hospital mortality and complication data
4.Training and technical support for the online data collection tool.
5. Telephone support at 111-844-844 Ext: 1492

CROP—the CathPCI Registry Data Quality Control

The following five steps will be taken to support data quality control in the CathPCI registry:

1. A password protected Web-based data entry access to designated and trained personnel at each participating center

2. Real-time automatic logic and range checks will be routinely done on the completeness and validity of the data, integrated in the data entry system to control basic data quality at the point of entry

3. Data checks will be performed by the local cardiologist responsible for the data quality and data collection

4. The data management team will regularly provides data quality checks and send queries for illogical, missing data elements and invalid data

5. On-site visits by a clincial support team from other participating centers will be will be done regularly to go through and review medical records of patients drawn to check the accuracy of data

CARDIAC COMMUNITY OF PAKISTAN

CROP STEERING COMMITTEE

Dr. Bashir Hanif
Director

Dr. Ejaz Ahmed

Dr. Nadir Khan

Dr. Zubair Akram

Dr. Amber Malik

Dr. Azhar Kayani

Dr. Tahir Sagheer

Dr. Akhter Ali BandeShah

Dr. Kamran Babar

Dr. Ahmed Fawwad

Dr. Adnan Gul

Dr. Nauman Naseer

Dr. Kashif Shaikh

Dr. Rana Omar

Dr. Parvaz Khan

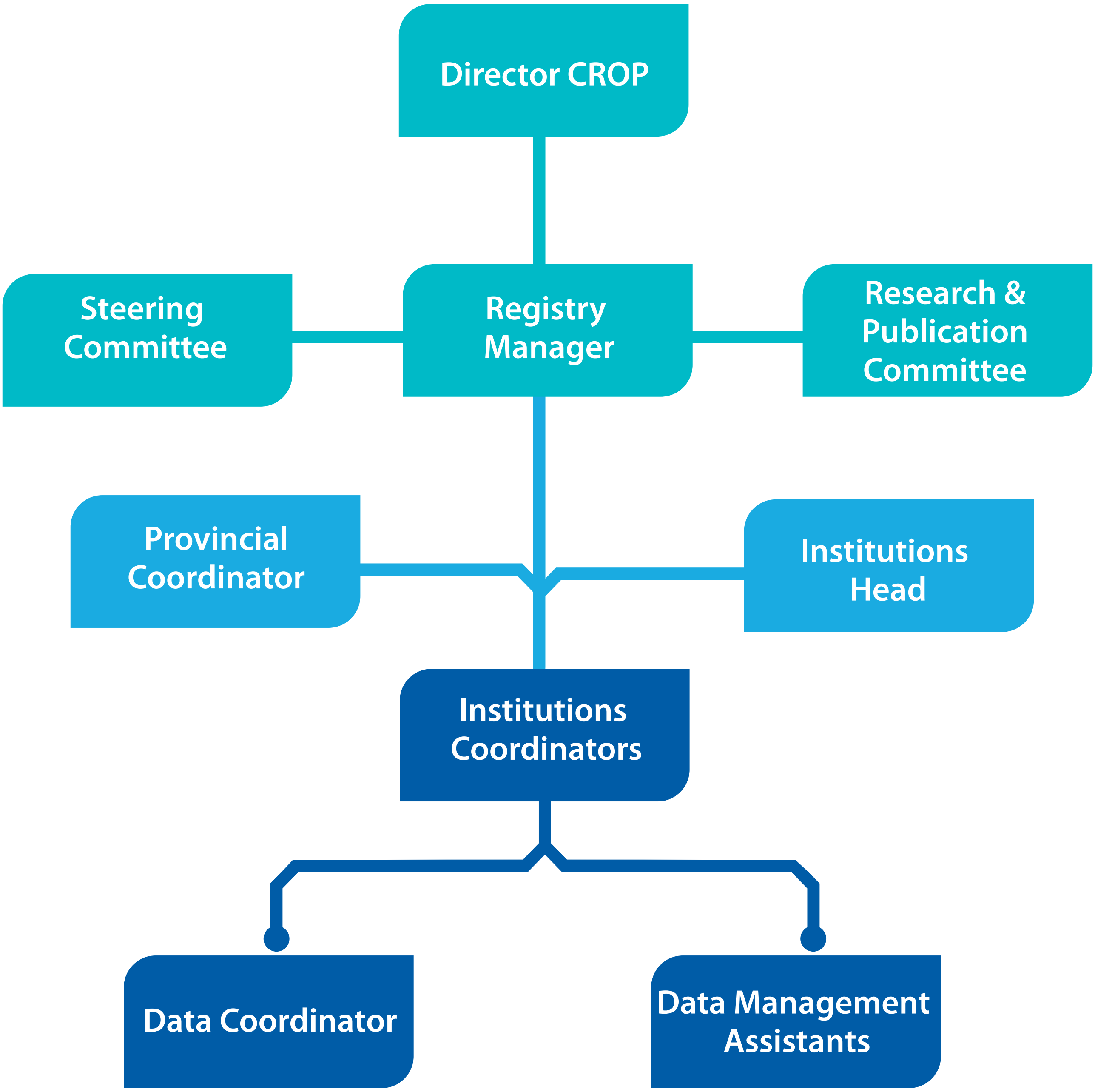
Dr. Mujeebullah Tareen

Dr. Zakiuddin Ahmed
General Secretary, HealthRAB

Dr. Syed Shahid Noor
Chairman Registry Committee, HealthRAB

Rehan Malik
Coordinator Steering committee

CROP ORGANOGRAM



STAKE HOLDERS

CROP Leadership

CROP is a Pakistan Society of Interventional Cardiology initiative in collaboration with Pakistan Cardiac Society and HealthRAB, which was approved by all major stakeholders at a meeting held at PC hotel in Karachi.

A steering committee, led by Dr. Bashir Hanif as its director, comprising of senior cardiologists from initial participating centers along with a member from HealthRAB are responsible for the planning and execution of CROP with technical and logistical support.

CROP will provide a unique opportunity to accurately assess current clinical practices and outcomes, and benchmark with other institutions nationally and internationally and devise local clinical practice guidelines. These data contribute to an ongoing process of quality assurance, indicating areas where education is necessary.

Cardiac Registry of Pakistan could not have been formed without the commitments of its valuable stake holders. Each stake holder has been very supportive and cooperative for creating this initiative valuable for better care of patient and quality.

Pakistan Society of Interventional Cardiology(PSIC)

Pakistan Society of Interventional Cardiology was established on a small scale back in 2005. It has come a long way since then despite immense challenges in a developing country. It aims at uplifting interventional practices in Pakistan to international standards, maintain adequate level of training, strengthening International collaborations through conferences and meetings. National database and Registry systems are one of the most important priorities of PSIC.

The main goal of PSIC is to promote cardiac health in Pakistani population by education, advanced interventional methods and improved preventive strategies.

Pakistan Cardiac Society

Pakistan Cardiac Society was established in 1966 by small group of dedicated and committed physicians. The main purpose of establishing this society is to promote and propagate the causes of cardiovascular sciences, carry out and promote research in cardiovascular sciences, spread modern concepts of preventive and clinical cardiovascular medicine and health education among with the public and health care provider, publish scientific material on topics related to cardiovascular sciences, develop and implement credentialing and quality standards in all aspects of cardiovascular health care, and to do all such other things as may be found necessary or proper for the achievement of all these purpose.

First Data Registry Meeting

Health Research Advisory Board (HealthRAB)

Health Research Advisory Board (HealthRAB) is a "think tank" of senior clinicians, researchers & academicians who are committed to the mission of Health RAB which is to "Develop the Research Ecosystem of Pakistan".

The members of HealthRAB represent major clinical specialties, medical institutions and associations and possess relevant expertise and experience to spearhead such a significant component of our health system.

Objectives

- Provide leadership for developing the medical research ecosystem of Pakistan.
- Create synergy among the existing stake holders and bring them together.
- Build capacity of the human resource involved in conducting research.
- Collaborate & network locally as well as globally to initiate research activities in the country.
- Facilitate the development of a national research policy & strategy.

Disease Registries

1. Cardiac Registry of Pakistan	(CROP)
2. Pakistan National Joint Registry	(PNJR)
3. Diabetes Registry of Pakistan	(DROP)
4. Stroke Registry of Pakistan	(SROP)
5. Hepatitis Registry of Pakistan	(HROP)

www.healthrab.org

CROP REGIONAL STAKE HOLDERS NETWORK

Regional Heads:

Sindh	Dr. Tahir Sagheer
Punjab	Dr. Ejaz Ahmed
KPK	Dr. Adnan Gul
Balochistan	Dr. Mujeeb Ullah Tareen
Islamabad	Dr. Akhtar Ali Bandeshah

Participating Facility	City	Province	Principle Investigator
Tabba Heart Institute	Karachi	Sindh	Dr. Bashir Hanif
National Institute Cardiovascular Diseases	Karachi	Sindh	Dr. Tahir Sagheer
ISRA University Hospital	Hyderabad	Sindh	Dr. Kashif Shaikh
Multan Institute of Cardiology	Multan	Punjab	Dr. Ejaz Ahmed
Combined Military Hospital	Lahore	Punjab	Col. Nadir Khan
Jinnah Hospital	Lahore	Punjab	Dr. Zubair Akram
Shaikh Zayed Hospital	Lahore	Punjab	Dr. Amber Malik
Rawalpindi Institue of Cardiology	Rawalpindi	Punjab	Gen. Azhar Kiyani
Omar Cardiac Hospital	Lahore	Punjab	Dr. Rana Omar
Shalamar Hospital	Lahore	Punjab	Dr. Kamran Babar
Bahria International Hospital	Lahore	Punjab	Dr. Nouman Naseer
Lady Reading Hospital	Peshawar	KPK	Dr. Adnan Gul
North West General Hospital	Peshawar	KPK	Dr. Ahmed Fawad
Bolan Medical Complex	Quetta	Balochistan	Dr. Jalaluddin Achakzai
Civil Hospital	Quetta	Balochistan	Dr. Mujeeb Ullah Tareen
PIMS Hospital	Islamabad	ICT	Dr. Akhtar Ali Bandeshah
Pakistan Atomic Energy Hopsital	Islamabad	ICT	Dr. Parvaz Khan

CROP DATA QUALITY CONTROL

There are five steps to support data quality control in the registry:

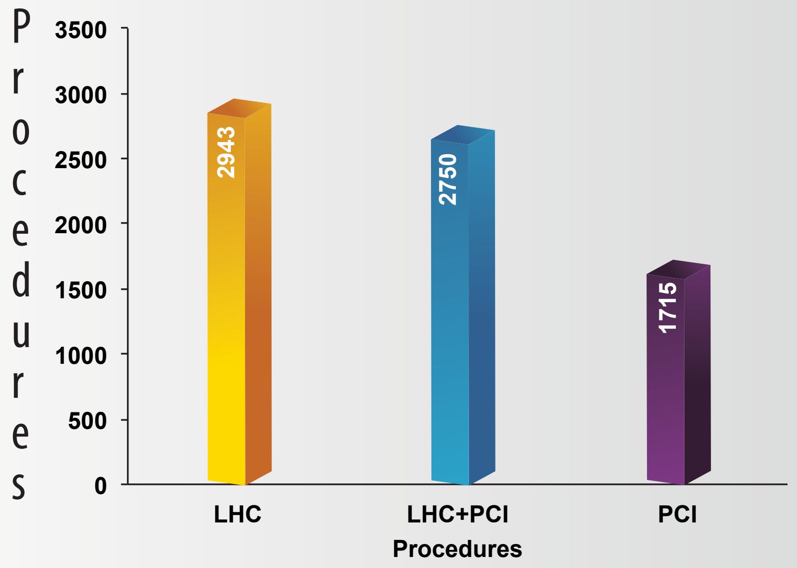
1. Web-based data entry access is password protected to trained personnel at each hospital
2. Real-time automatic logic and range check on the completeness and validity of the data are integrated in the data entry system to control basic data quality at the point of entry
3. Data checks are performed by the local cardiologist responsible for the data quality of data collection
4. The data management team regularly provides data quality checks and sends queries for illogical, missing data elements and invalid data
5. On-site audits by cardiologist at Clinical support team are planned to go through and review medical records of patients drawn to check the accuracy of data

Manager CROP with NCDR Team

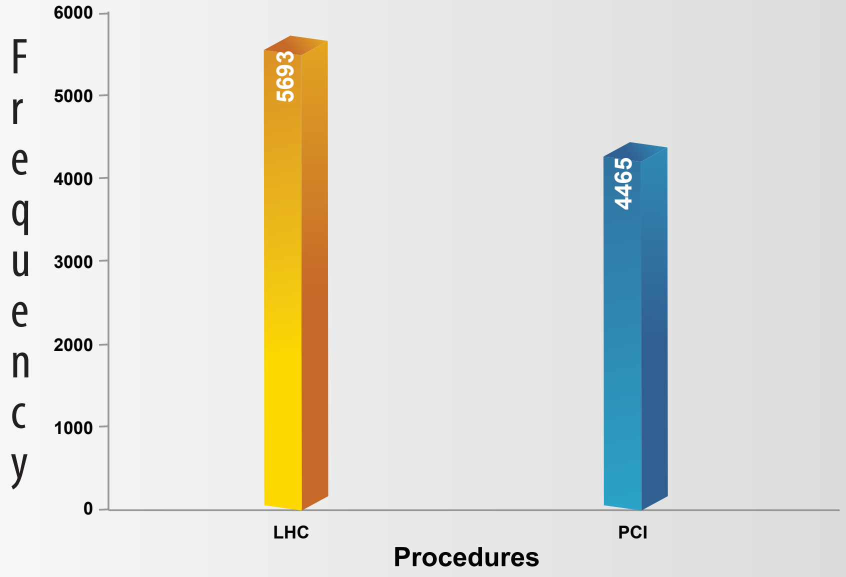
DATA ANALYSIS & INTERPRETATION

DEMOGRAPHICS

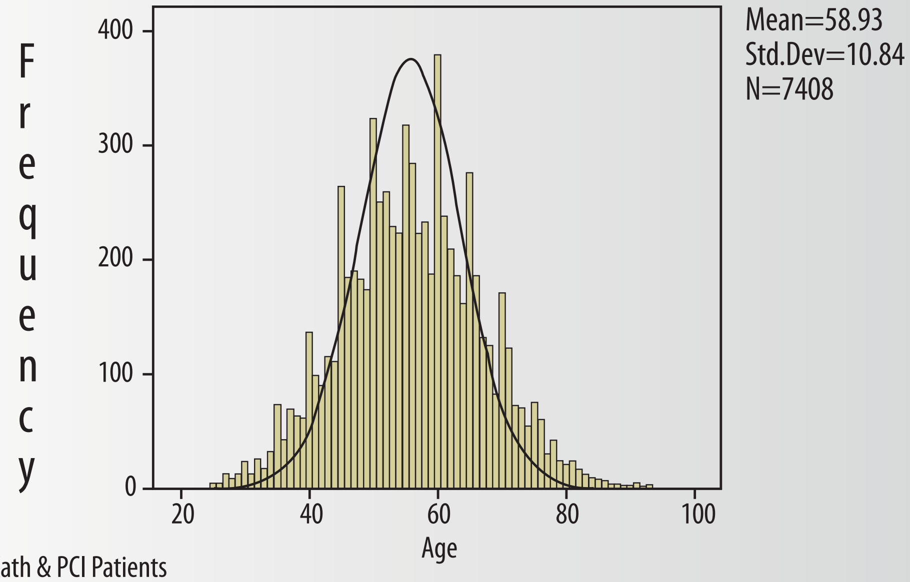
Total No. of Procedures



LHC and PCI Overall

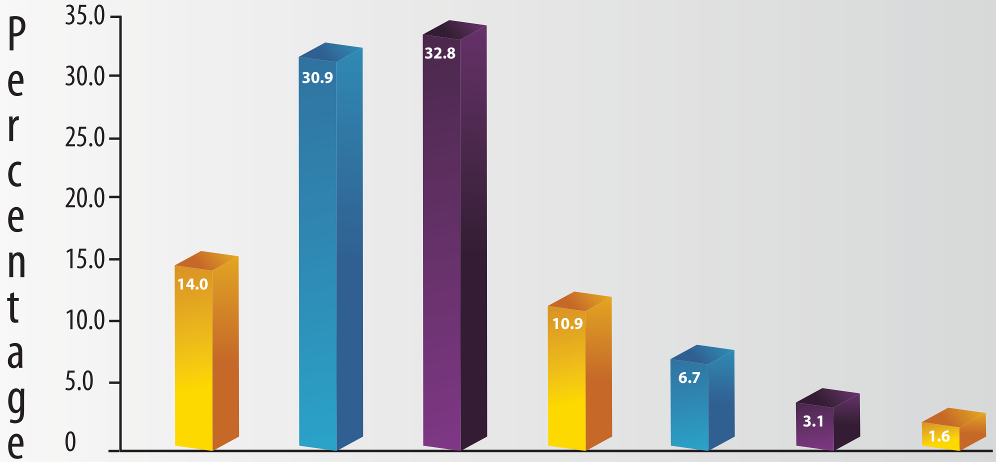


Age Distribution Average Age



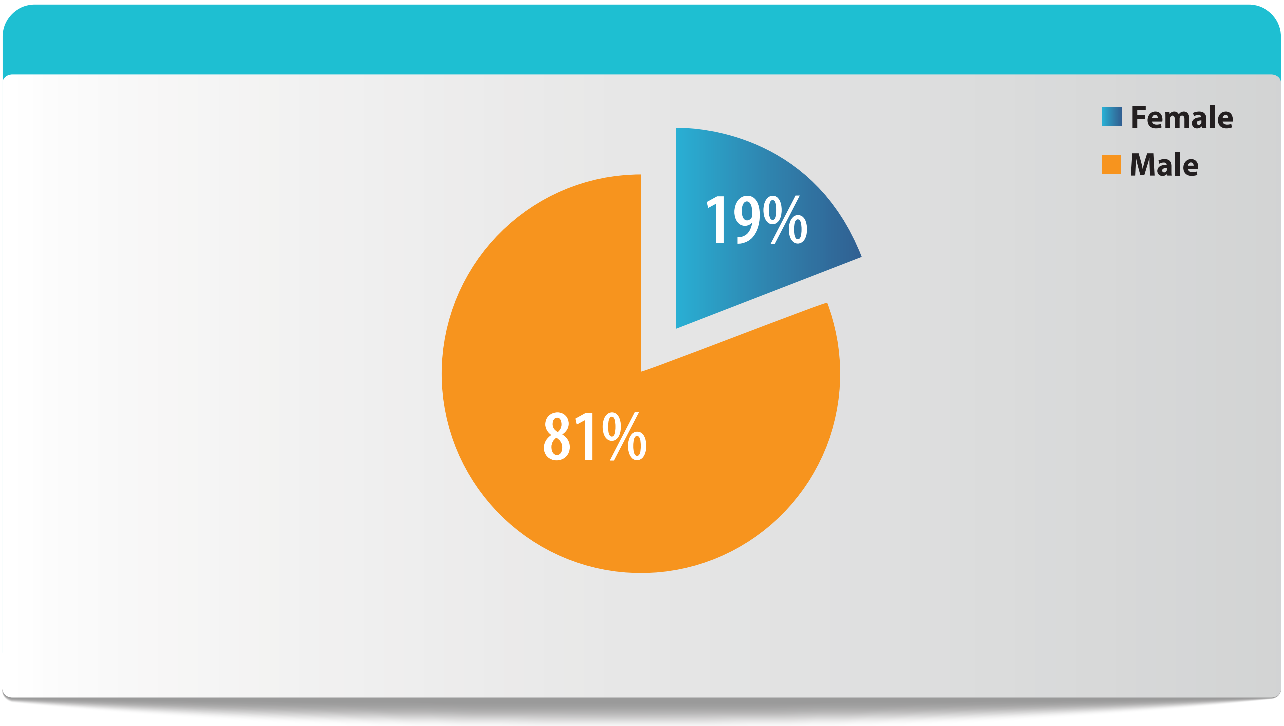
All Diagnostic Cath & PCI Patients

Age Groups in Years



All Diagnostic Cath & PCI Patients

Gender Distribution

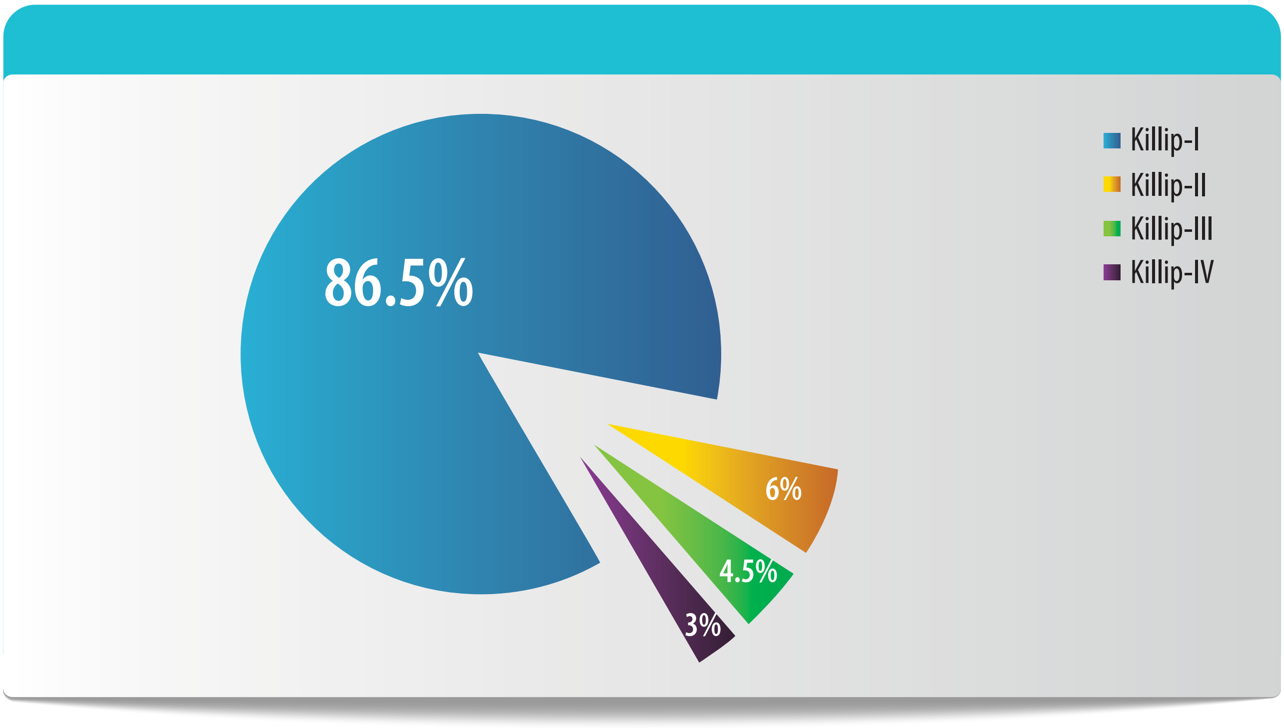


PRESENTATION AND HISTORY

Cardiac Status on Arrival to Hospital (ACS Patient Only)

Status	%
Heart Failure	6.3
Cardiac Arrest	1.4
Cardiogenic Shock	1.3
TPM	0.7

Killip Class STEMI Only



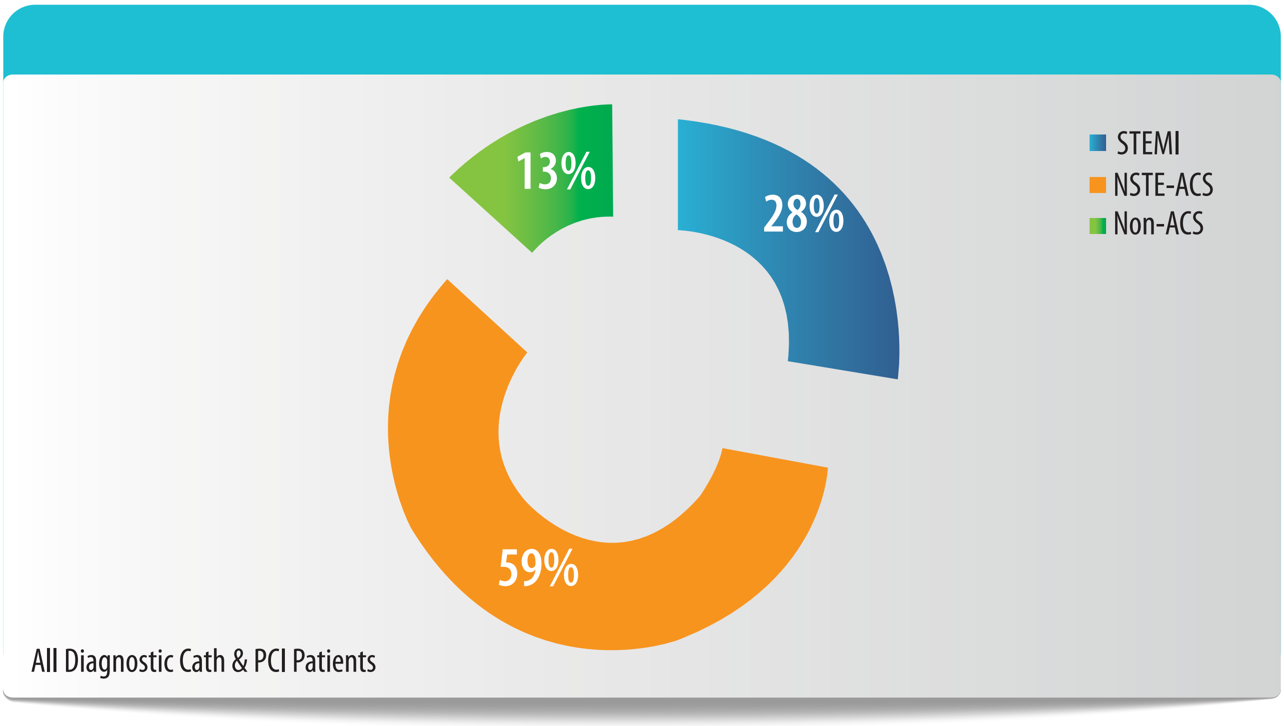
Co-morbidities

Co-morbid	%
Current/Recent Smoker	25.6
Prior Heart Failure	3.2
Hypertension	61.3
Family History (CAD)	14.8
Dyslipidemia	24.8
Cerebrovascular Disease	2.0
Other Tobacco (Chewed)	5.4
Diabetes Mellitus	40.8

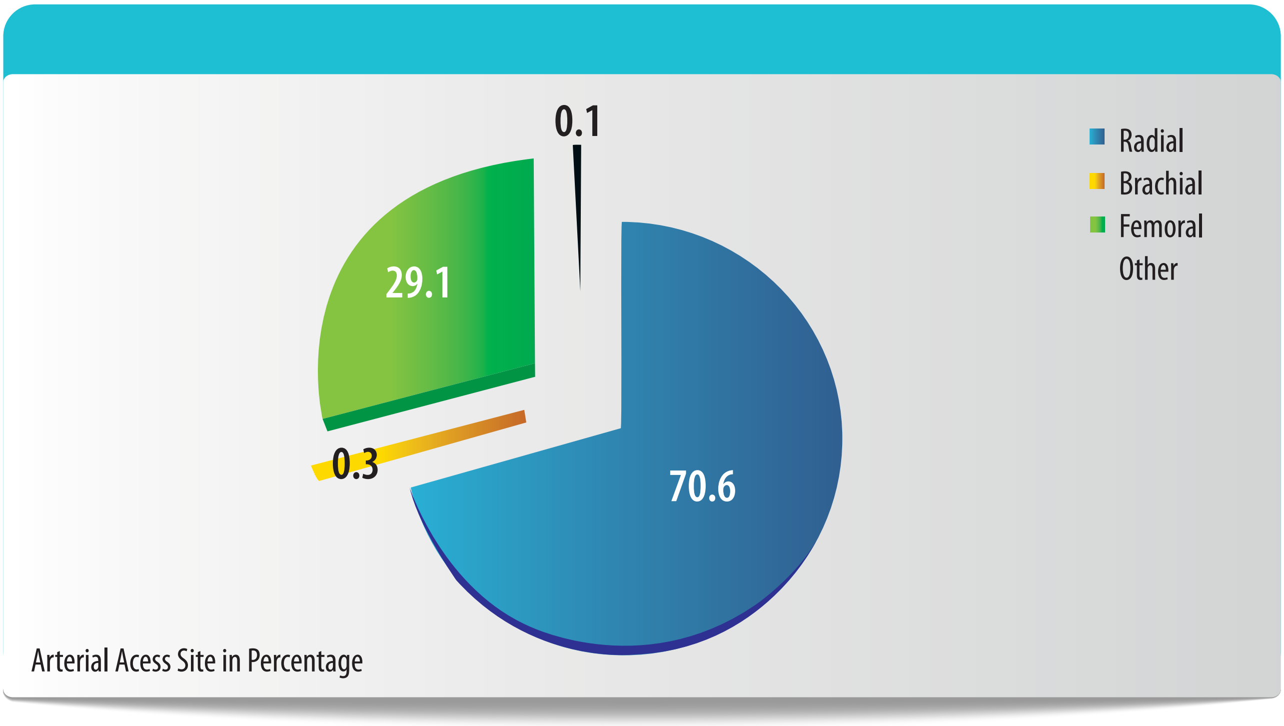
Co-morbid	%
Prior MI	25.2
Prior PCI	9.3
Prior CABG	3.8
Prior Valve Surgery	0.6

All Diagnostic Cath & PCI Patients

Indications for Cath Visit

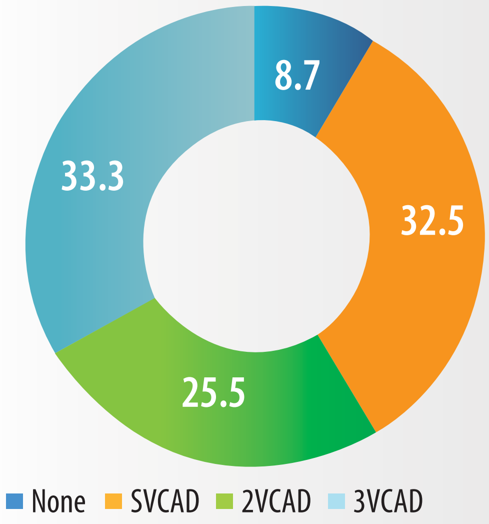


Arterial Access Site

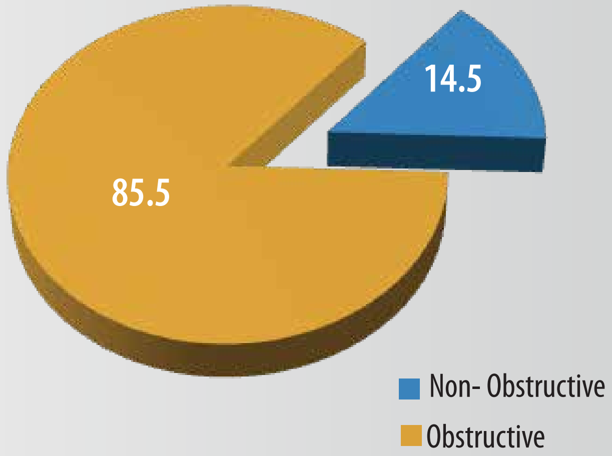


CORONARY ANGIOGRAPHY

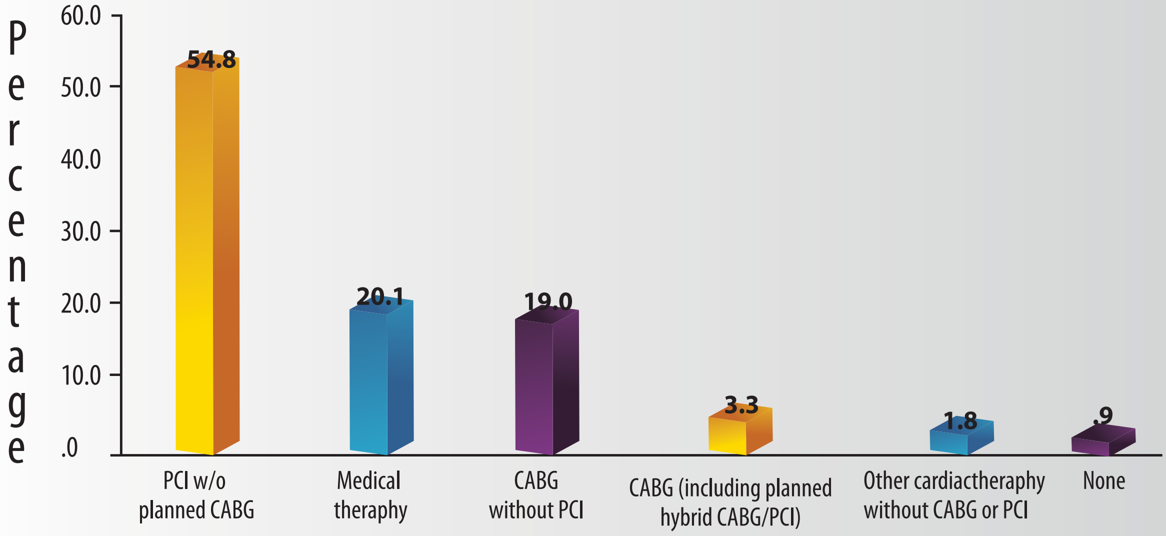
Diagnostic Cath Coronary Anatomy



incident of Non-Obstructive CAD (Elective Patients only)
(CMP, Pre valve Evaluation & Positive Stress Test Excluded)

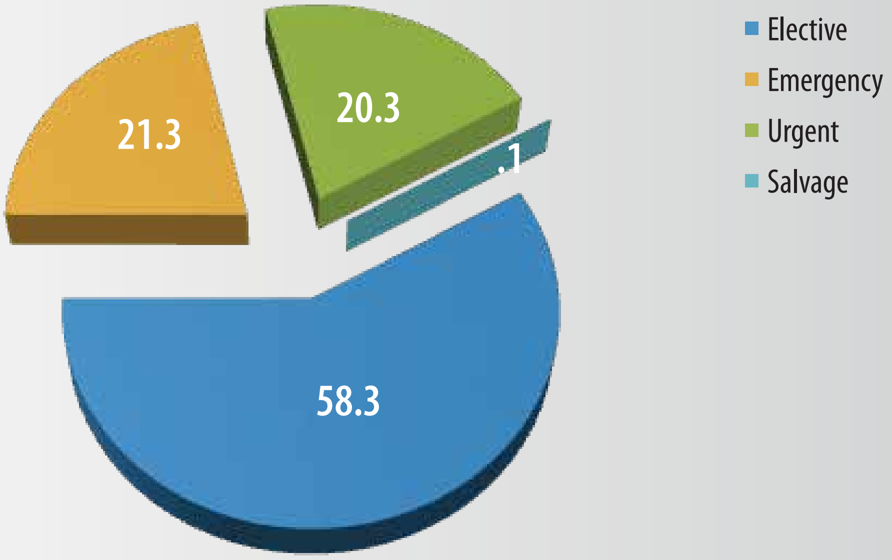


Diagnostic Cath Treatment Recommendation



PCI PROCEDUERS

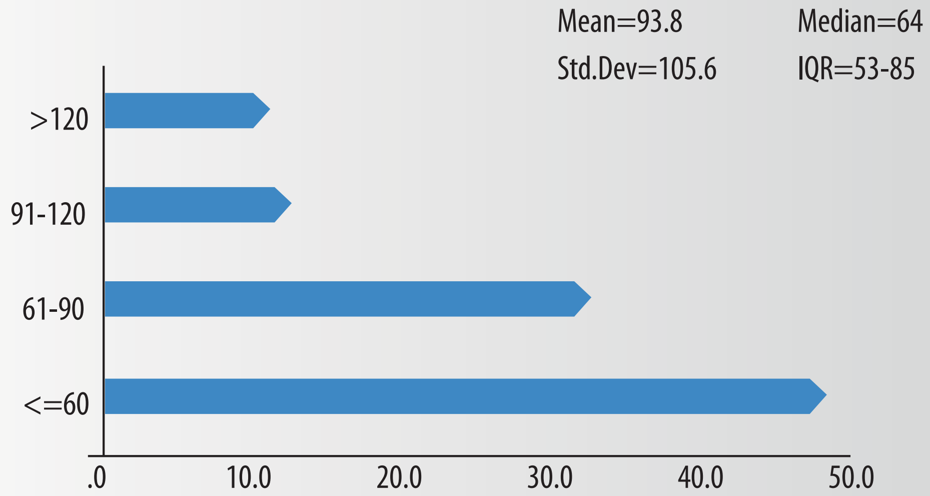
Status of PCI



PCI Indications

Indications	%
Immediate PCI for STEMI	19.8
PCI for STEMI (Unstable, >12 hrs from Sx onset)	3.3
PCI for STEMI (Stable, >12 hrs from Sx onset)	12.8
PCI for STEMI (Stable after full dose Thrombolysis)	3.9
Rescue PCI for STEMI (after failed dose lytics)	1.0
PCI for high risk Non STEMI or Unstable Angina	45.4
Staged PCI	4.3
Other	9.5
Total	100.0

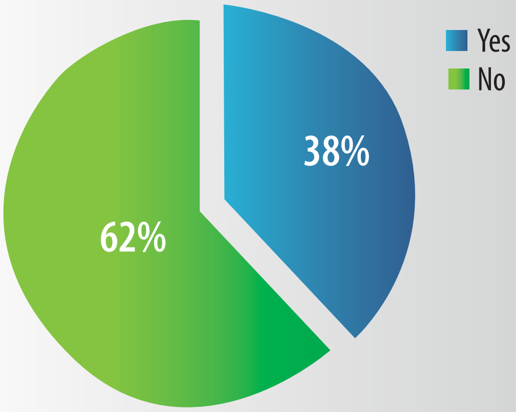
Door to Balloon Time in Minutes For Primary PCI



Mean=93.8 Median=64
Std.Dev=105.6 IQR=53-85

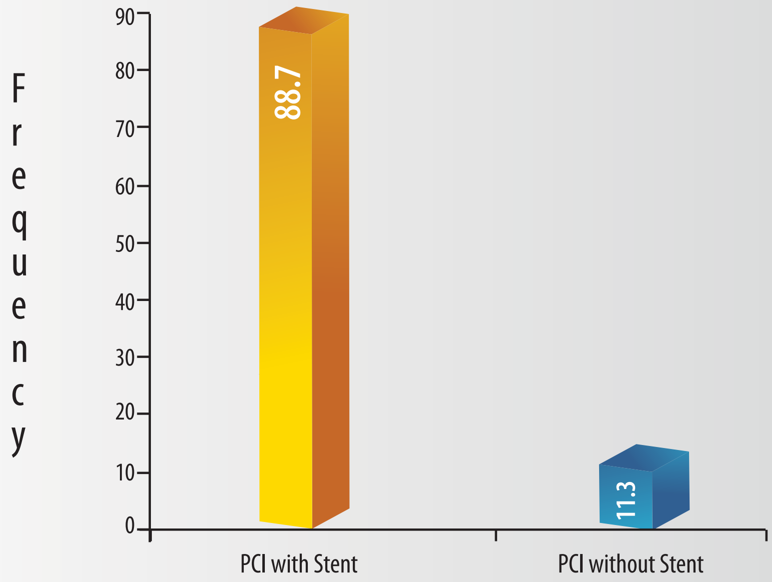
<=60	61-90	91-120	>120
47.0	31.4	11.5	10.1

Elective PCIs(Non-ACS)With Prior Stress or Imaging Study

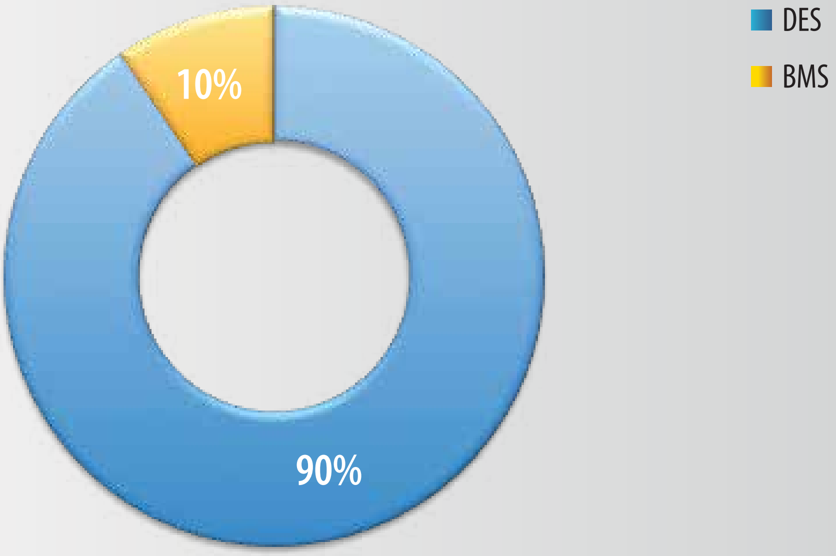


Stress or Imaging	%
Yes	38.0
No	62.0
Total	100

PCI with or without Stent



DES vs BMS

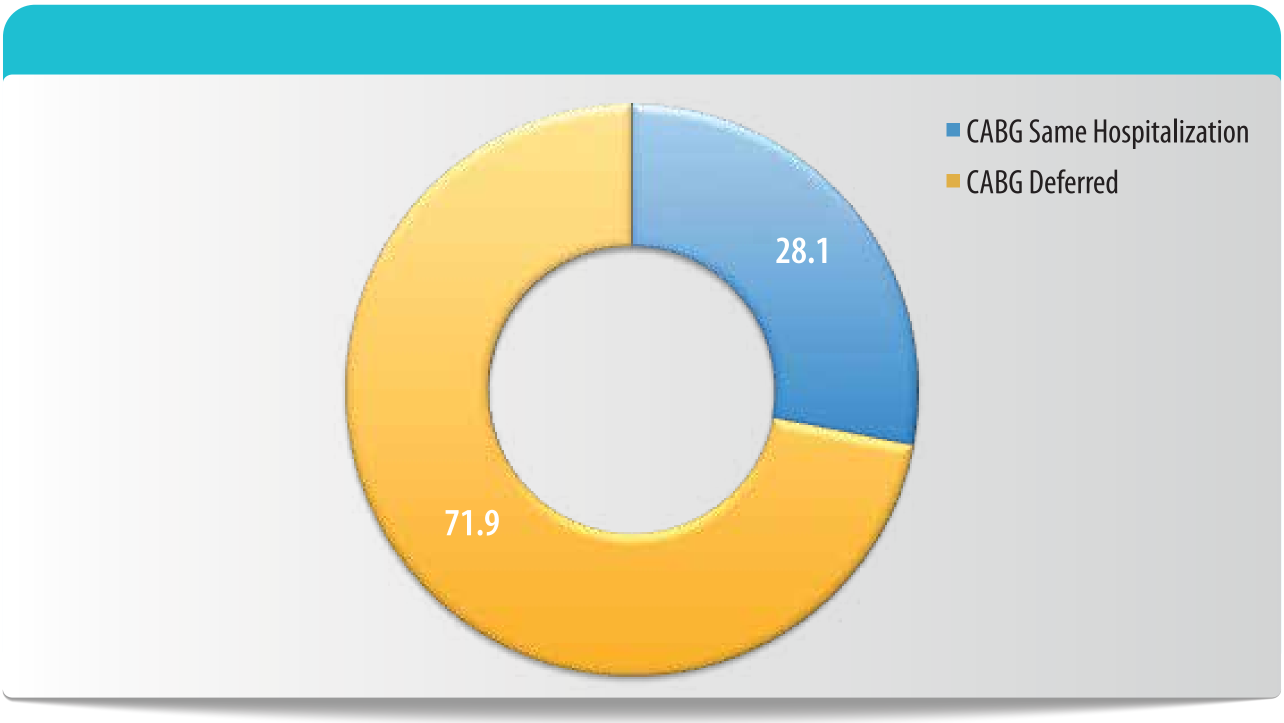


APPROPRIATE USE CRITERIA (AUC) FOR PCI

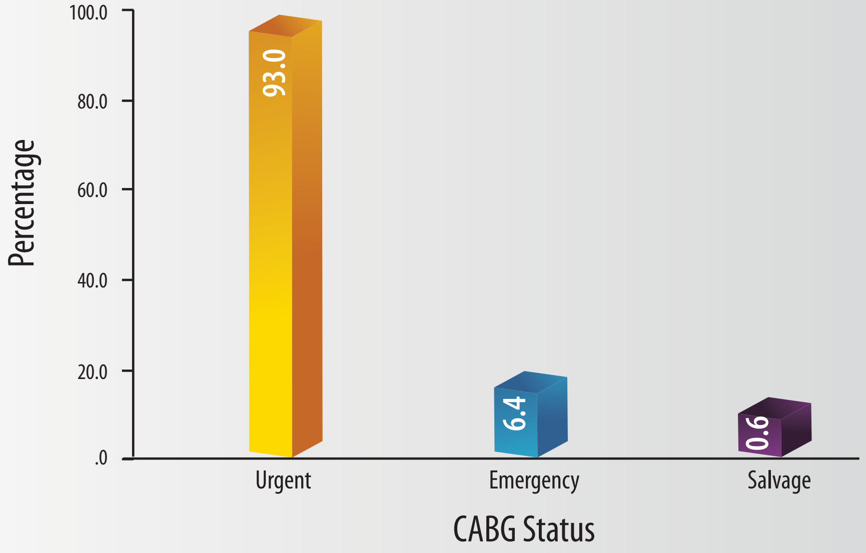
AUC Ratings	Percentage
Appropriate	51.5
Inappropriate	0.8
Uncertain	42.5
Not Classifiable	5.3
Total	100

Based on NCDR AUC 2012 Model

CABG During Index Hospitalization



CABG Status



Intra Procedure Event (PCI)

Events	**%**
Significant Dissection	2.7
No Reflow	2.1
Hemodynamic Instability Req Rx	1.3
Arrhythmia Req Rx	1.2
Cardiac Arrest in Lab	0.6
Abrupt Closure Req Rx	0.3
Perforation	0.2
Major Contrast Reaction	0.0

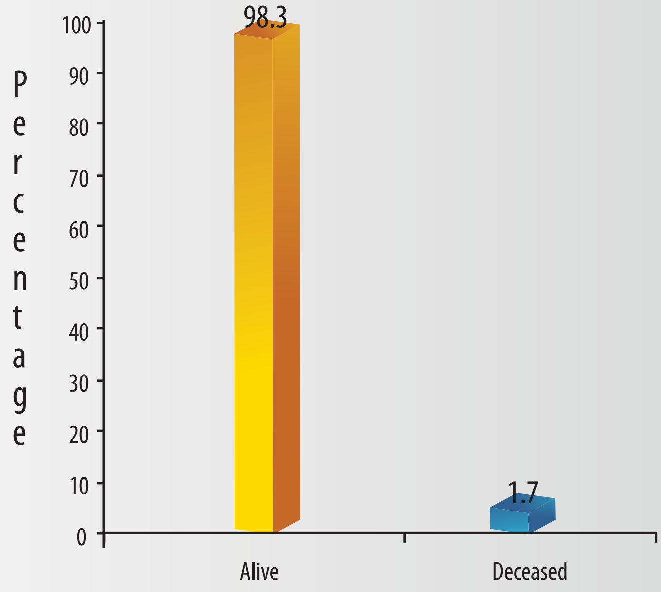
Post Procedure Events

Events	%
Cardiogenic Shock	1.3
Heart Failure	0.7
Myocardial Infraction (Positive Biomarker)	0.2
New Requirements for Dialysis	0.2
Blood Transfusions	0.2
CVA/Stroke	0.1
Tamponade	0.0
Vascular Complication	0.0

Bleeding Events

Events	(n) Percentage
Bleeding Event W/in 72 Hours	(65/7408) 0.9
Hematoma at Assess Site	(51/7408) 0.7
Other Bleed	(05/7408) 0.06
GI Bleed	(03/7408) 0.04
GU Bleed	(02/7408) 0.02
Retroperitoneal Bleed	(02/7408) 0.02
Access Site Bleeding	(09/7408) 0.1

Discharge Status



Presentation Based Outcome

Presentation	Discharge Status		Overall
	Alive	Deceased	
STEMI	96.0%	4.0%	100%
NST-ACS	99.6%	0.4%	100%
Non-ACS	100%	0.0%	100%

STEMI Killip-Class Outcome (PCI)

Presentation	Discharge Status		Overall
	Alive	Deceased	
Killip-I	98.1%	1.9%	100%
Killip-II	91.0%	9.0%	100%
Killip-III	77.5%	22.5%	100%
Killip-IV	58.4%	41.6%	100%

Risk Adjusted Mortality (RAM) in PCI Patients

	Overall	STEMI	STEMI Excluded
Predicted	0.5%	1.2%	0.1%
Observed	1.6%	4.0%	0.4%

Based on NCDR Risk Adjusted Mortality Model

> It is not enough to do your best;
> you must know what you do,
> and then do your best”
>
> (W. Edwards Deming)
> 1900-1993

List of Abbreviations

PCI	Percutaneous Coronary Intervention
LHC	Left Heart Catheterization
CABG	Coronary Artery Bypass Graft
ACS	Acute Coronary Syndrome
MI	Myocardial Infraction
RAM	Risk Adjusted Mortality
GU Bleed	Genital-Urinary Bleeding
GI Bleed	Gastrointestinal Bleeding
Req	Requiring
AUC	Appropriate Use Criteria

Institutional heads meeting held in Karachito discuss the CROP in November 2016

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CROP Secretariat:
Address: 510, 5th Floor Business Avenue, P.E.C.H.S. Block 6 Shahrah-e-Faisal, Karachi-75400, Pakistan
Tel: (92-21) 34315195-7, Email: Info@healthrab.org