An international comparison of technology utilization in an aged care setting

Project of:
The University of Missouri
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Columbia, Missouri, USA

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NSW, Sydney

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Background

Technology Roadmap for Aged Care in Australia
June 2017

- Enabling consumers to use technology

- Calls for increased consumer choice and control in decision-making

- Aged care organisations will need to uptake IT

- Upskill the aged care workforce's technology literacy.

Background

Long Term Post Acute Care HIT Collaborative Roadmap, USA 2012-2014

- Care coordination – enable customer-centered care planning and coordination across providers

- Quality – Leverage technology to support accountability, measurement, and improvement of outcomes

- Business Imperative – Leverage technology to gain efficiency

- Customer-Centered – Use technology to build on person-centered care

- Workforce Acceleration – Prepare the workforce to leverage technologies

Questions Left from Current Roadmaps

Baseline?

Facility Characteristics?

Adoption Patterns?

Relationship to Quality?
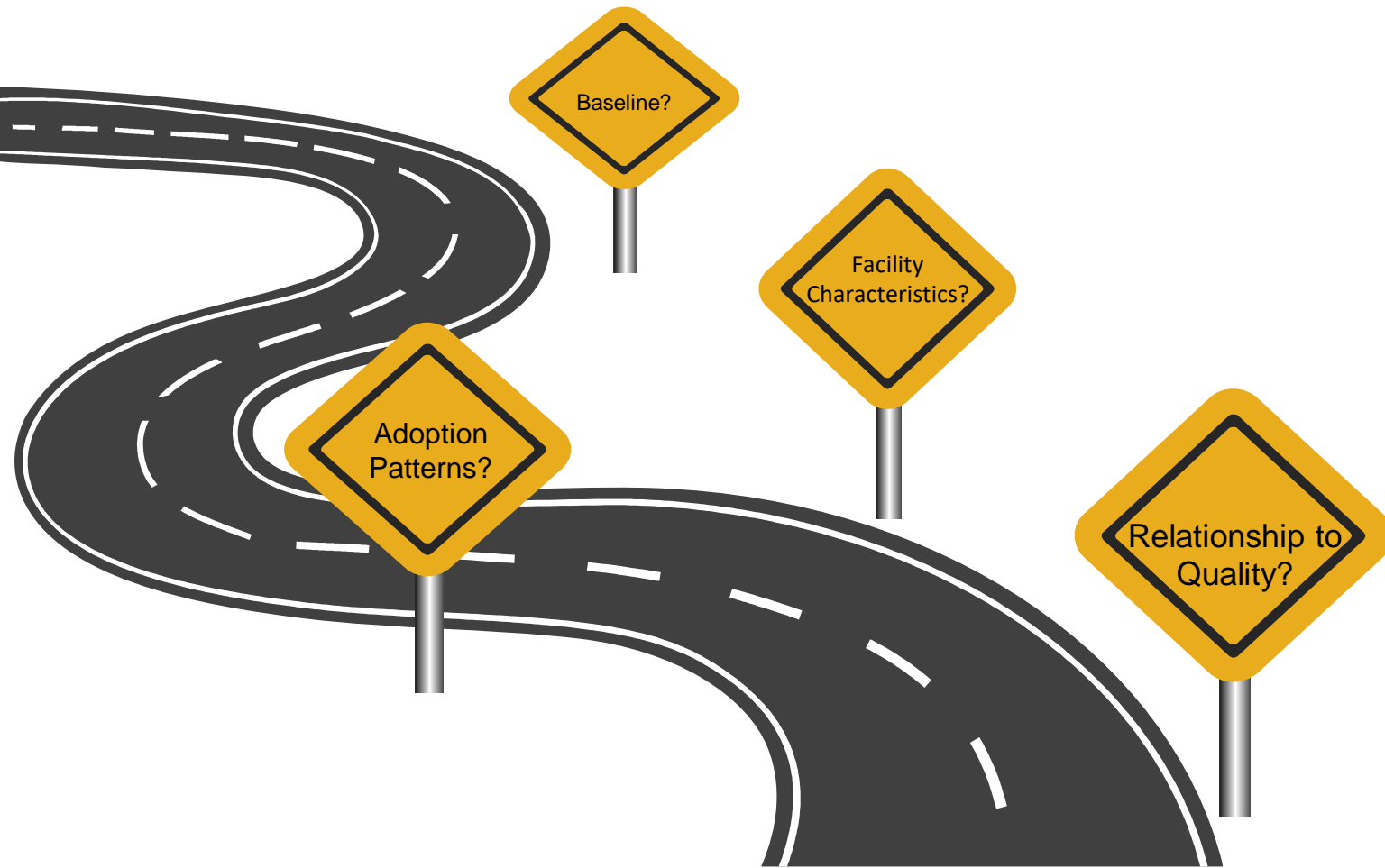
Framework for Assessing IT Maturation

Attributes of IT Maturity	Domains of Health Care	
	Resident care	Clinical support (Lab, Pharmacy, Radiology)
Capability	Resident care activities supported by technology	Clinical processes supported by technology
Extent of Use	Technology used in resident care activities	Technology used in clinical support
Integration (Internal and External)	Degree of integration of resident care technology	Degree of integration of clinical support technology

Components of Health IT Maturation:
Capabilities vs.
Extent of Use, Integration

CLINICAL NOTES   THERAPY/TREATMENT PLAN

Advance directives   Medical history and physical

ACTIVITIES OF DAILY LIVING (ADLS) MANAGEMENT

Physician Orders

Resident/Patient demographics (ADT)

Quality Measures

Allergy list

Laboratory Tests   Radiology Results

Medication reconciliation

Nursing care plans and flow sheets
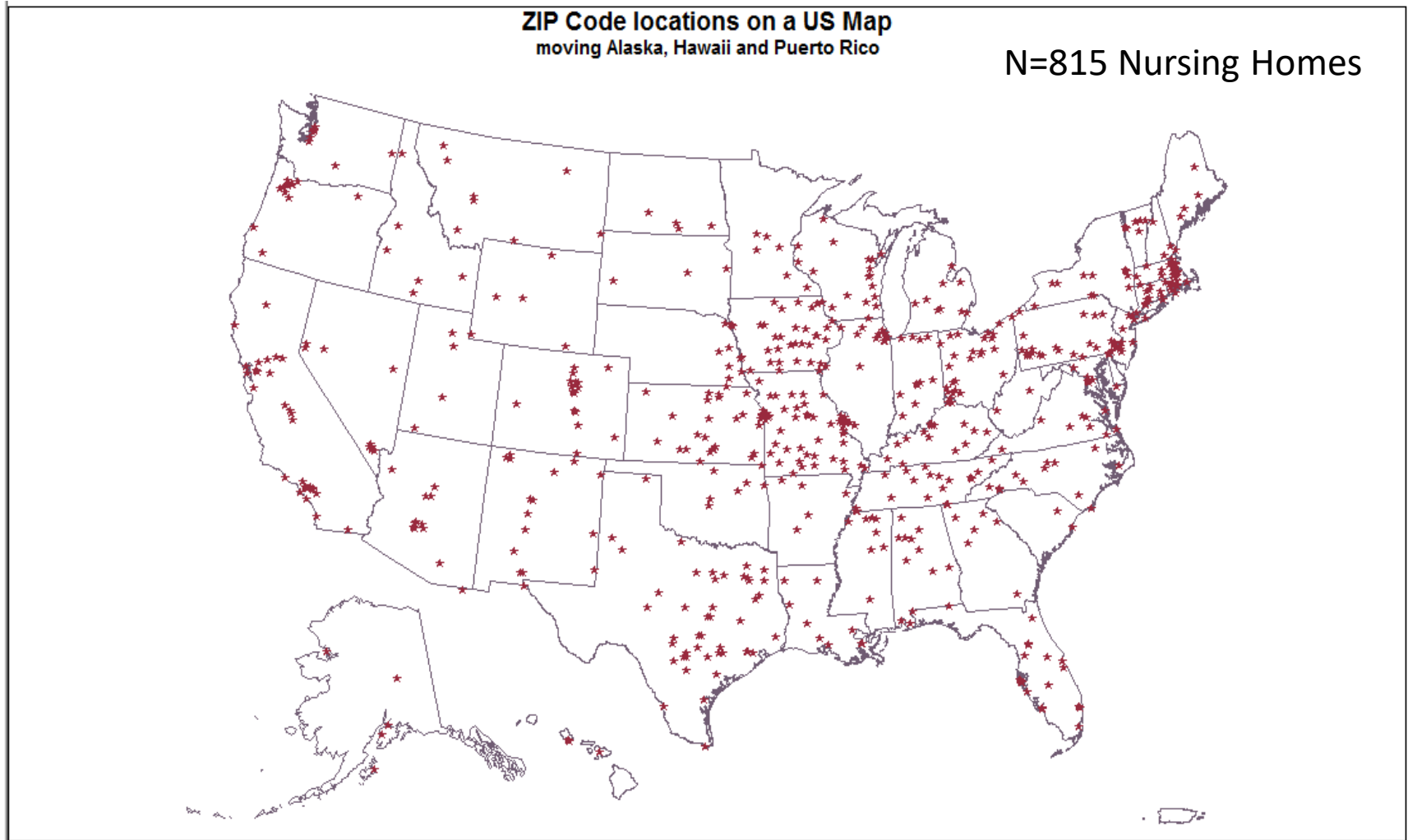
Diagnosis or condition list   Nursing Orders

Secure Messaging

Medication administration record (eMAR)   Vital signs (e.g., blood sugar, O2 levels)

Ongoing Studies in IT Maturation, USA

ZIP Code locations on a US Map
moving Alaska, Hawaii and Puerto Rico

N=815 Nursing Homes

Agency for Healthcare Research Quality, 2013-2018; 2017-2022 (PI: Alexander)
A National Report of Nursing Home Quality Measures and Information Technology

Ongoing Studies in IT Maturation, USA
2013-2017
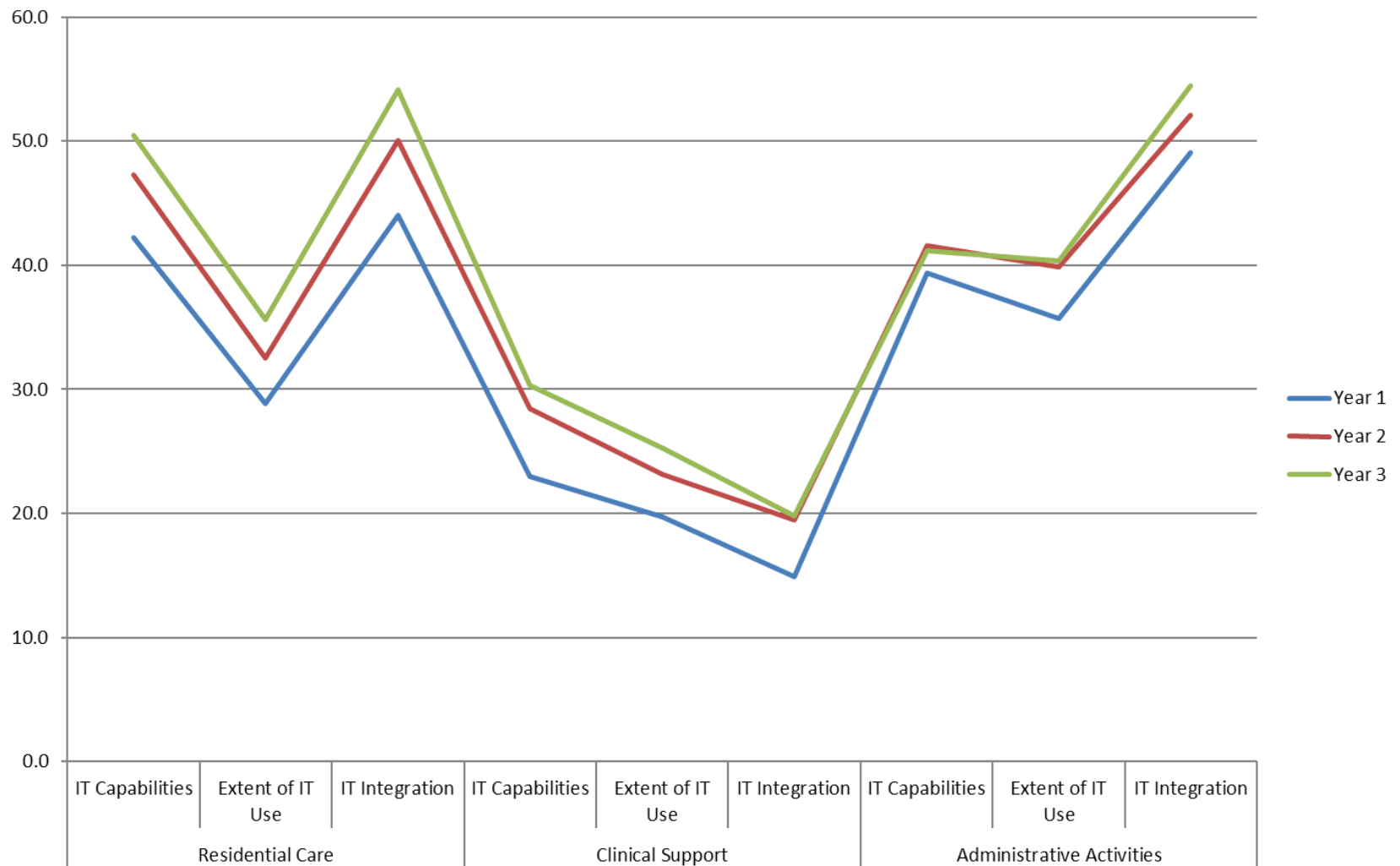
Agency for Healthcare Research Quality, 2013-2022 (PI: Alexander)
A National Report of Nursing Home Quality Measures and Information Technology

Statistical Differences Between Year 1 and Year 2 Change in IT Adoption and Quality Measures.

Health Domain	IT Measure	QM	QM Name	R^2 Y2-Y1 Differ	pvalue
Administrative	IT Capabilities	402	% LS Who Report Mod to Severe Pain	0.03	0.003
		404	% LS Who Loose to Much Weight	0.02	0.02
		406	% LS Cath Inserted and Left in Bladder	0.02	0.02
		407	% LS with UTI	0.02	0.04
	Extent of IT Use	401	% LS ADL Needs Increased	0.02	0.02
Resident Care	IT Capabilities	434	% SS Newly Received an Antipsychotic Med	0.02	0.03
	IT Integration	408	% LS who have Depressive Symptoms	0.02	0.04
		430	% SS Assessed/Given Pneumococcal Vaccine	0.02	0.04
Clinical Support	IT Capabilities	419	% LS Received an Antipsychotic Med	0.04	0.0003
	Extent of IT Use	415	% LS Assessed/Given Pneumococcal Vaccine	0.04	0.02
	IT Integration	409	% LS Who Were Physically Restrained	0.02	0.005

Research Aim

Explore the dimensions of IT maturity used to support resident care, clinical support in NHs in New South Wales, Australia.

Research Efforts

Interviewed 45 Aged Care Administrators from NSW, Queensland, ACT, South Australia, New Zealand

Adapted a US survey describing IT capabilities, extent of IT use, and degree of IT integration in resident care and clinical support to an Australian audience

Conducted a statewide survey in NSW Australia
130 useable responses out of 876 homes in NSW for a response rate of 130/876 = 15%

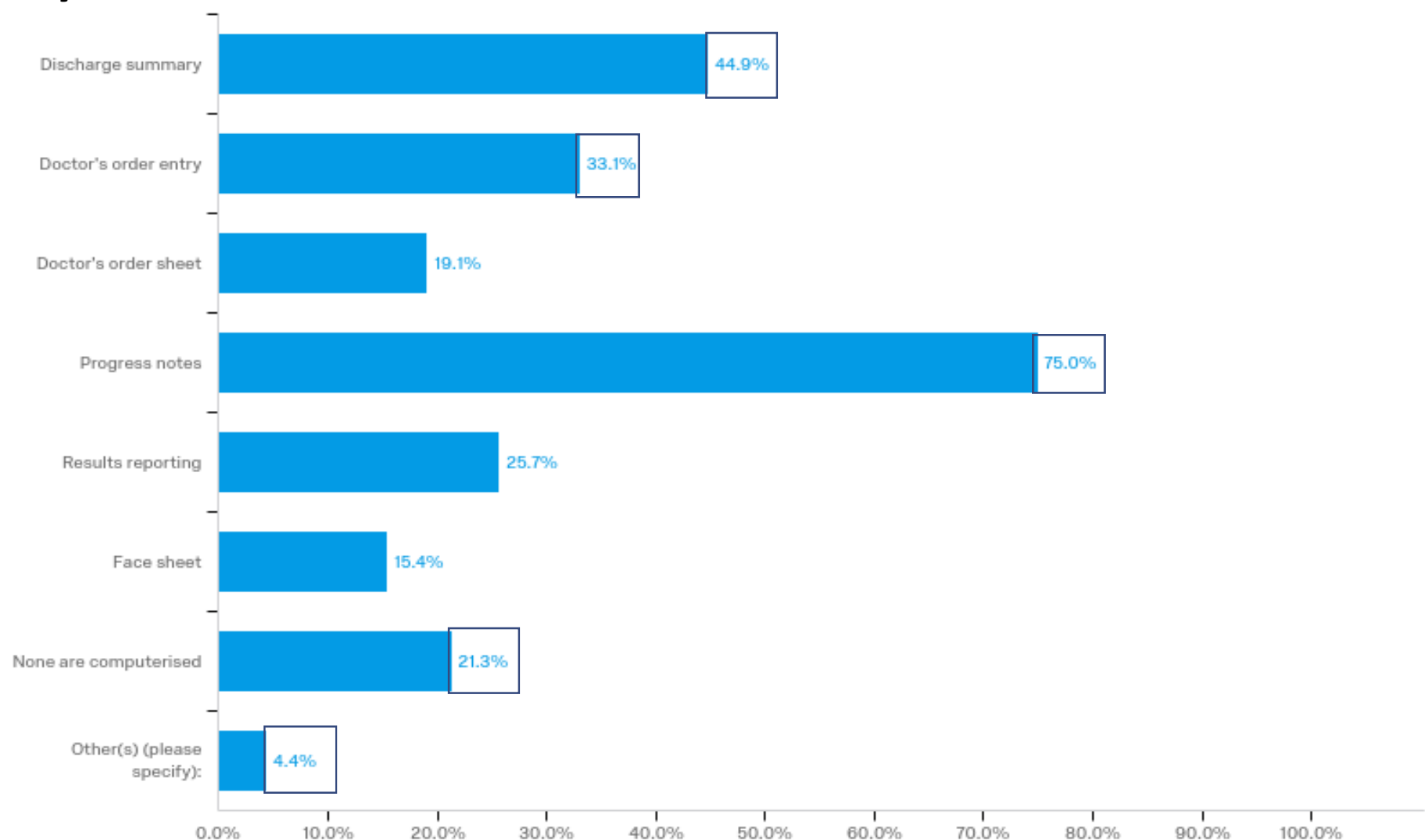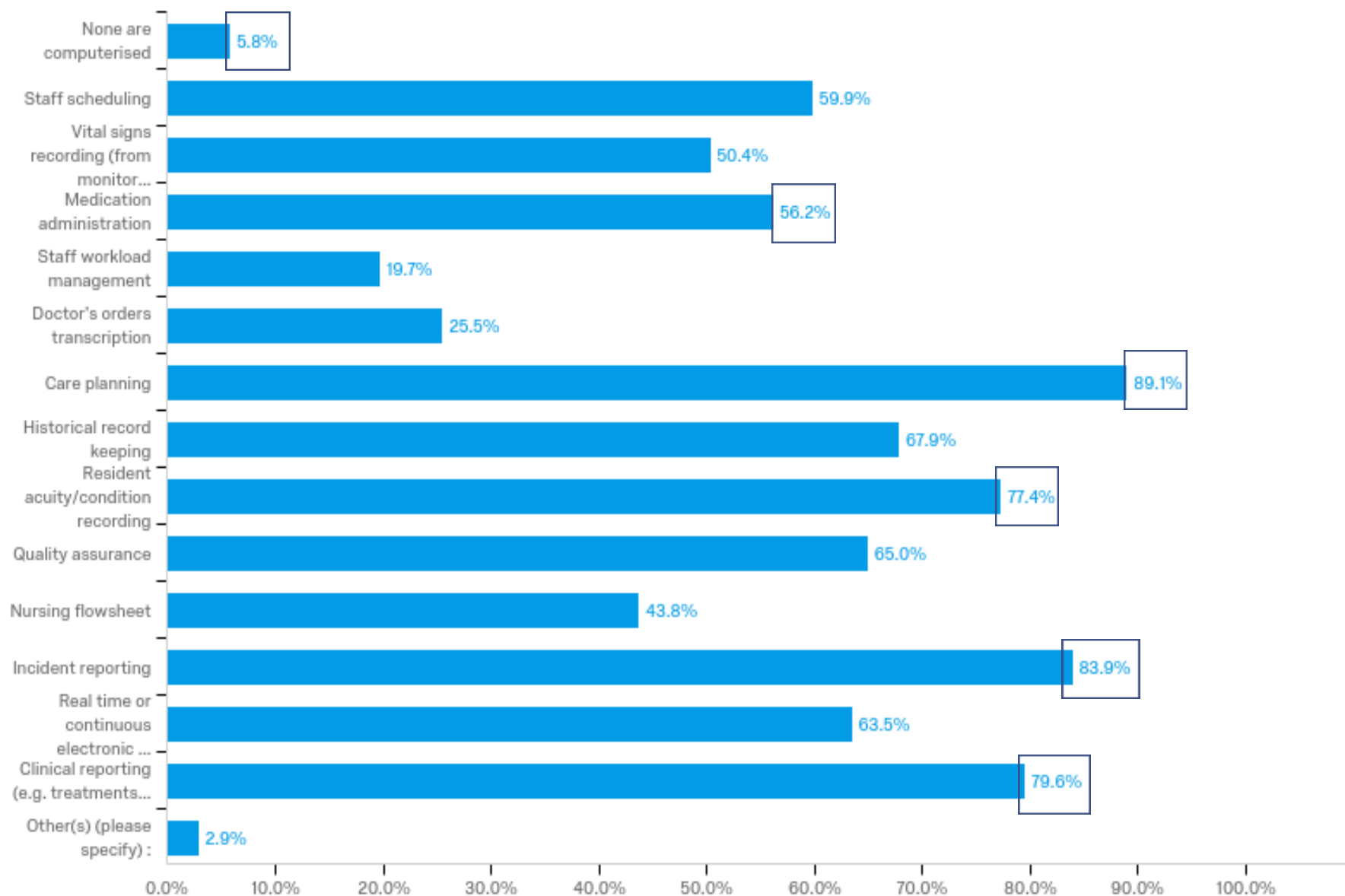# Overall Results IT Maturation N=130 Facilities

Estimated Means using Post-stratified weights
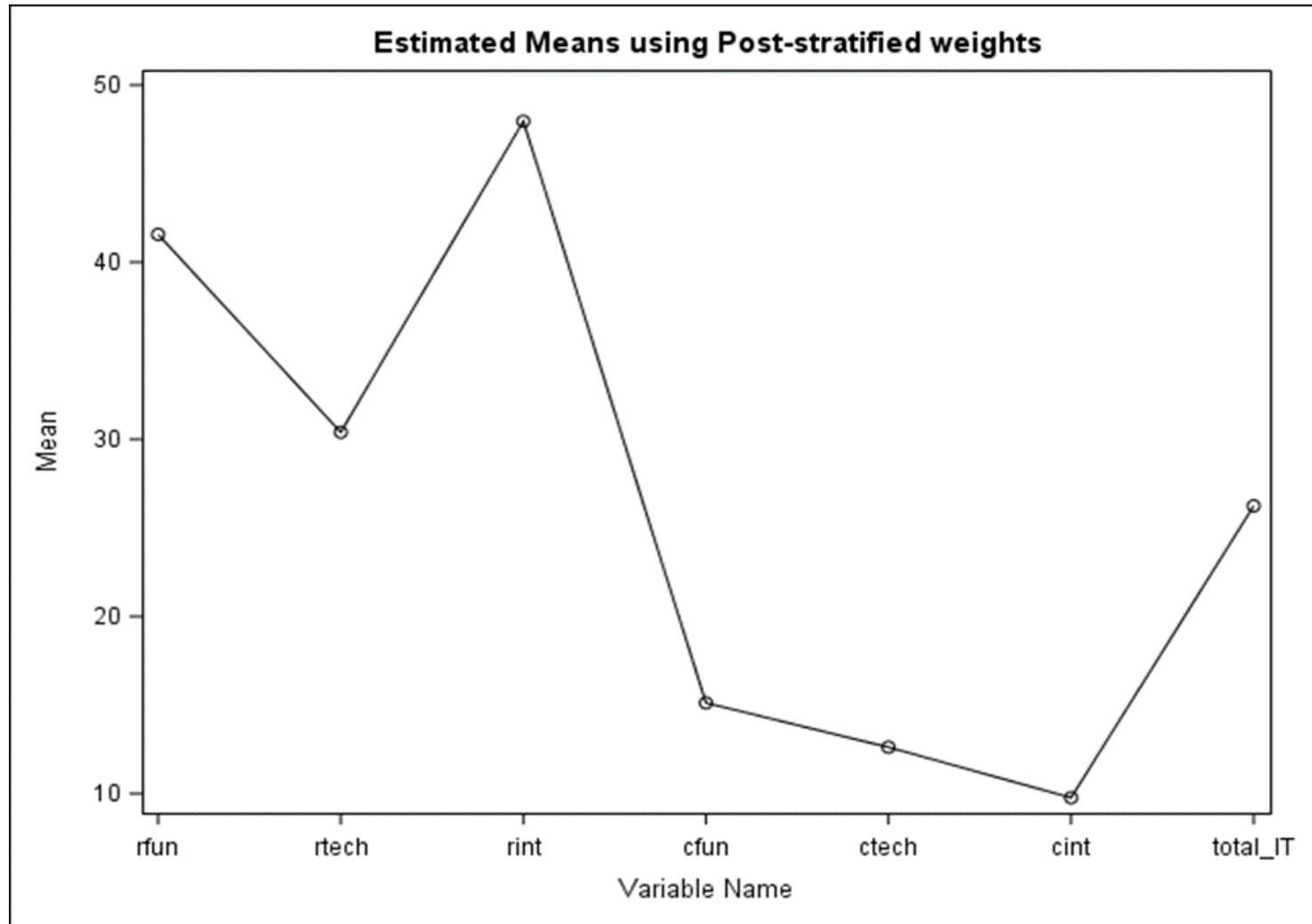
Resident Care Activities - Refers to those computer-based applications in support of physicians, nurses, and ancillary staff.

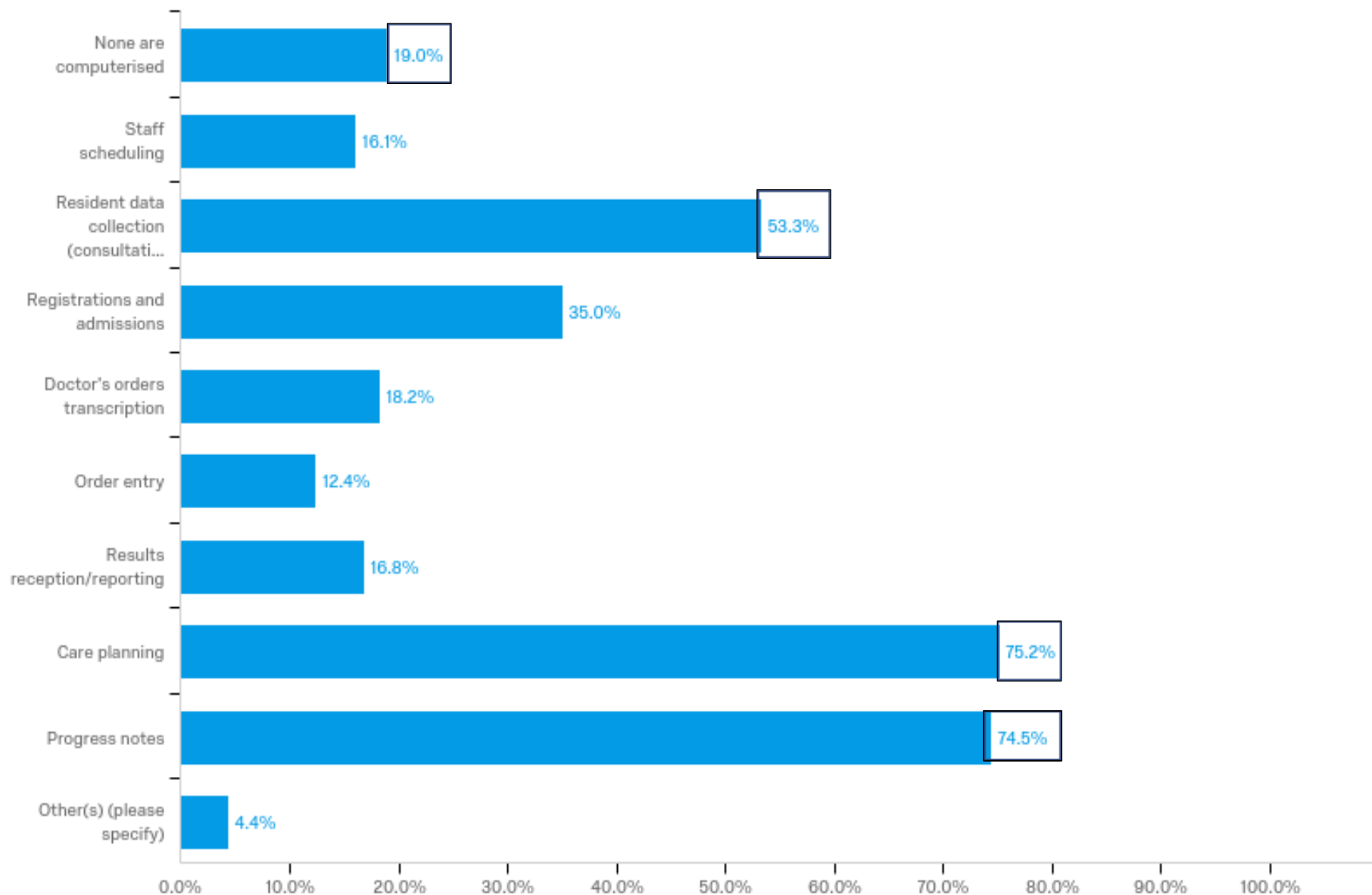## Physician

Nursing

Category	Percentage
None are computerised	5.8%
Staff scheduling	59.9%
Vital signs recording (from monitor...	50.4%
Medication administration	56.2%
Staff workload management	19.7%
Doctor's orders transcription	25.5%
Care planning	89.1%
Historical record keeping	67.9%
Resident acuity/condition recording	77.4%
Quality assurance	65.0%
Nursing flowsheet	43.8%
Incident reporting	83.9%
Real time or continuous electronic ...	63.5%
Clinical reporting (e.g. treatments...	79.6%
Other(s) (please specify) :	2.9%

PT/OT

PHYSICIAN STATS

How many physicians see residents in a typical year?

Residents seen	Percentage
1-10	49.2%
11-25	31.7%
26-50	14.3%
51-100	1.6%
>100	3.2%
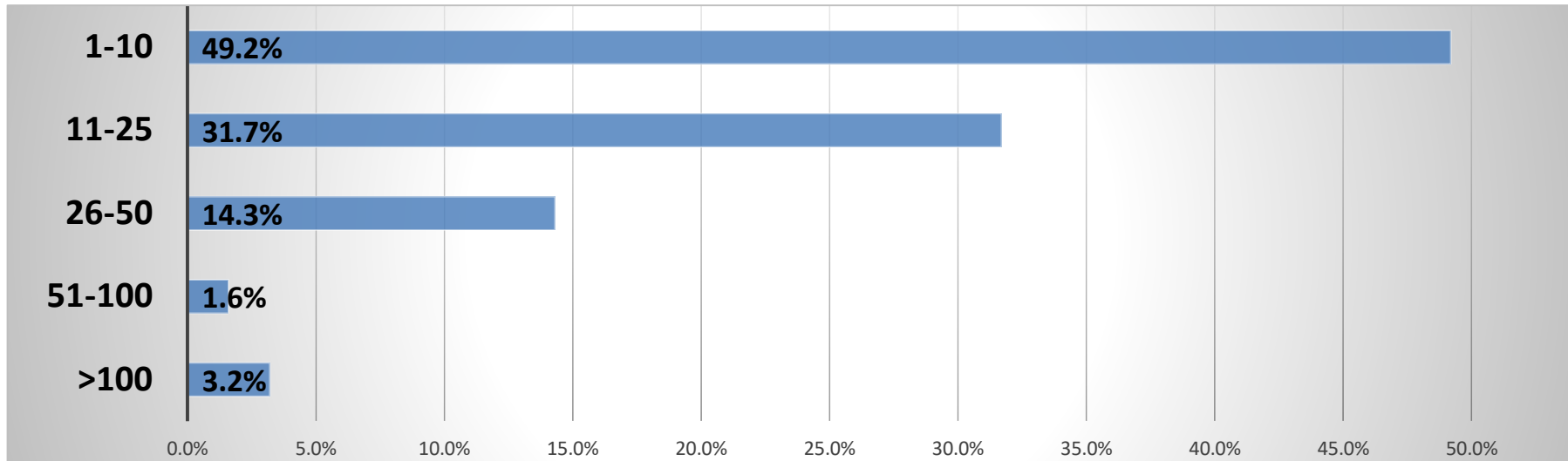
What percentage of these physicians are intensive users of your IT system?

Percentage of physicians	Percentage
0%	26.0%
1-20%	24.4%
21-40%	13.0%
41-60%	6.9%
61-80%	6.1%
>80%	23.7%
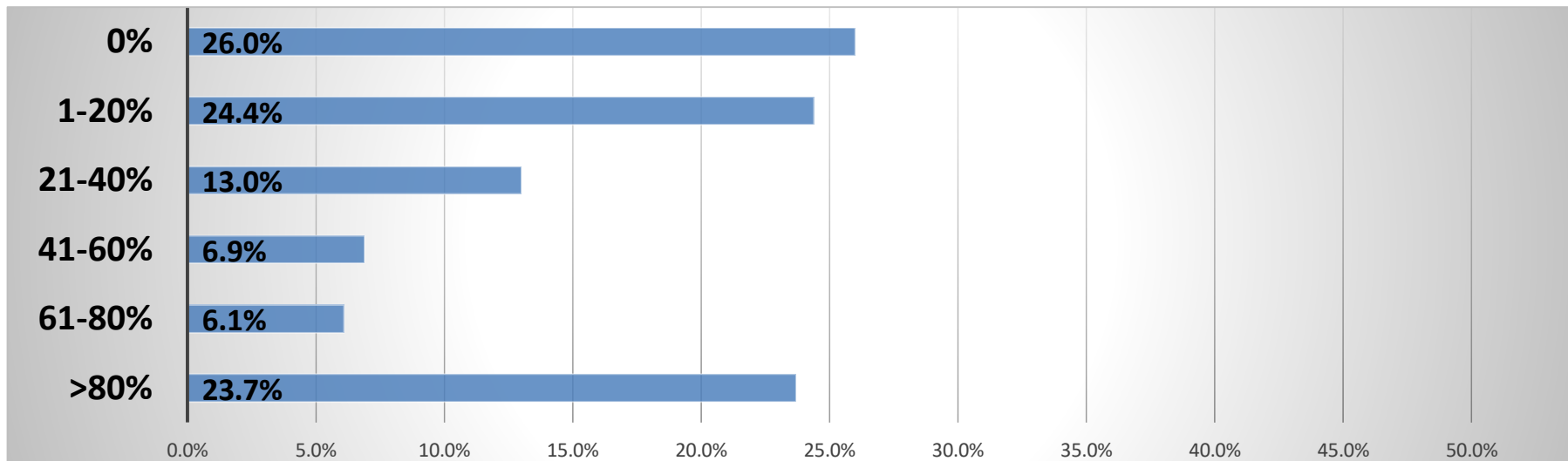
Patients/Patient's Representative Technology
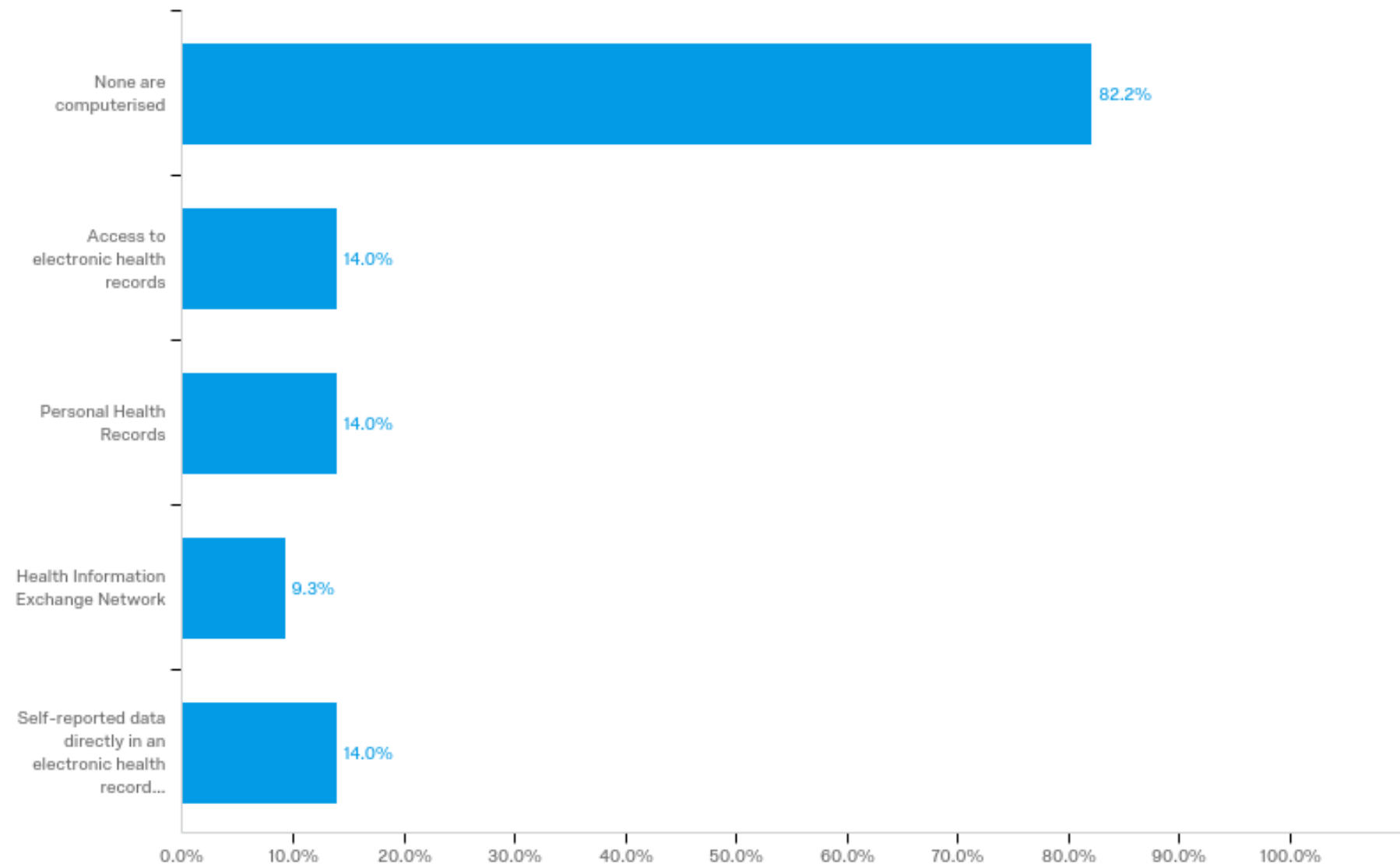
CLINICAL SUPPORT ACTIVITIES
Laboratories

Radiology

Category	Percentage
None are computerised	84.4%
Resident registration	6.7%
Label generation (for envelopes)	8.1%
Results capturing (X-rays, CT, Ultrasound)	11.1%
Other(s) (please specify):	2.2%
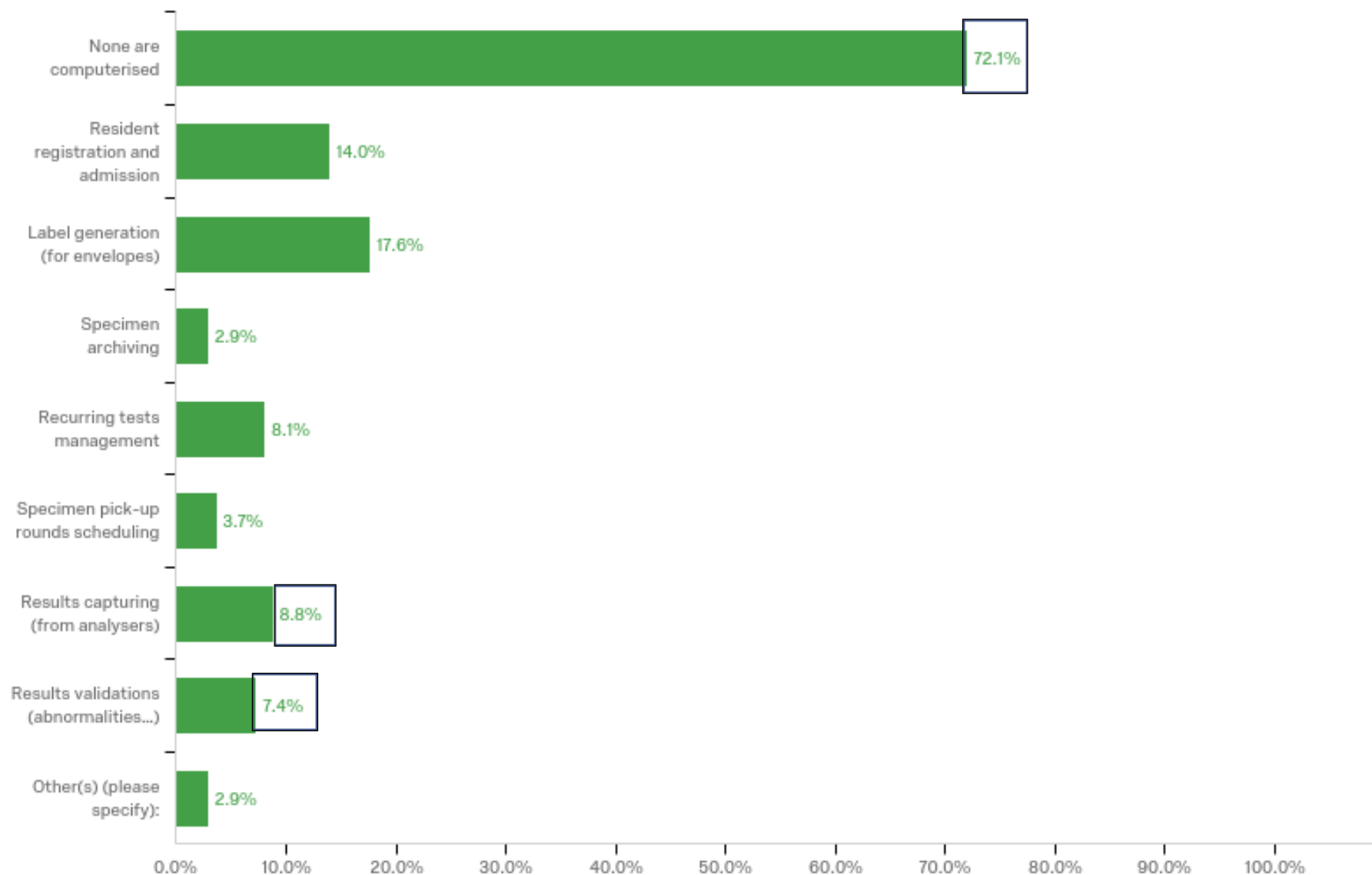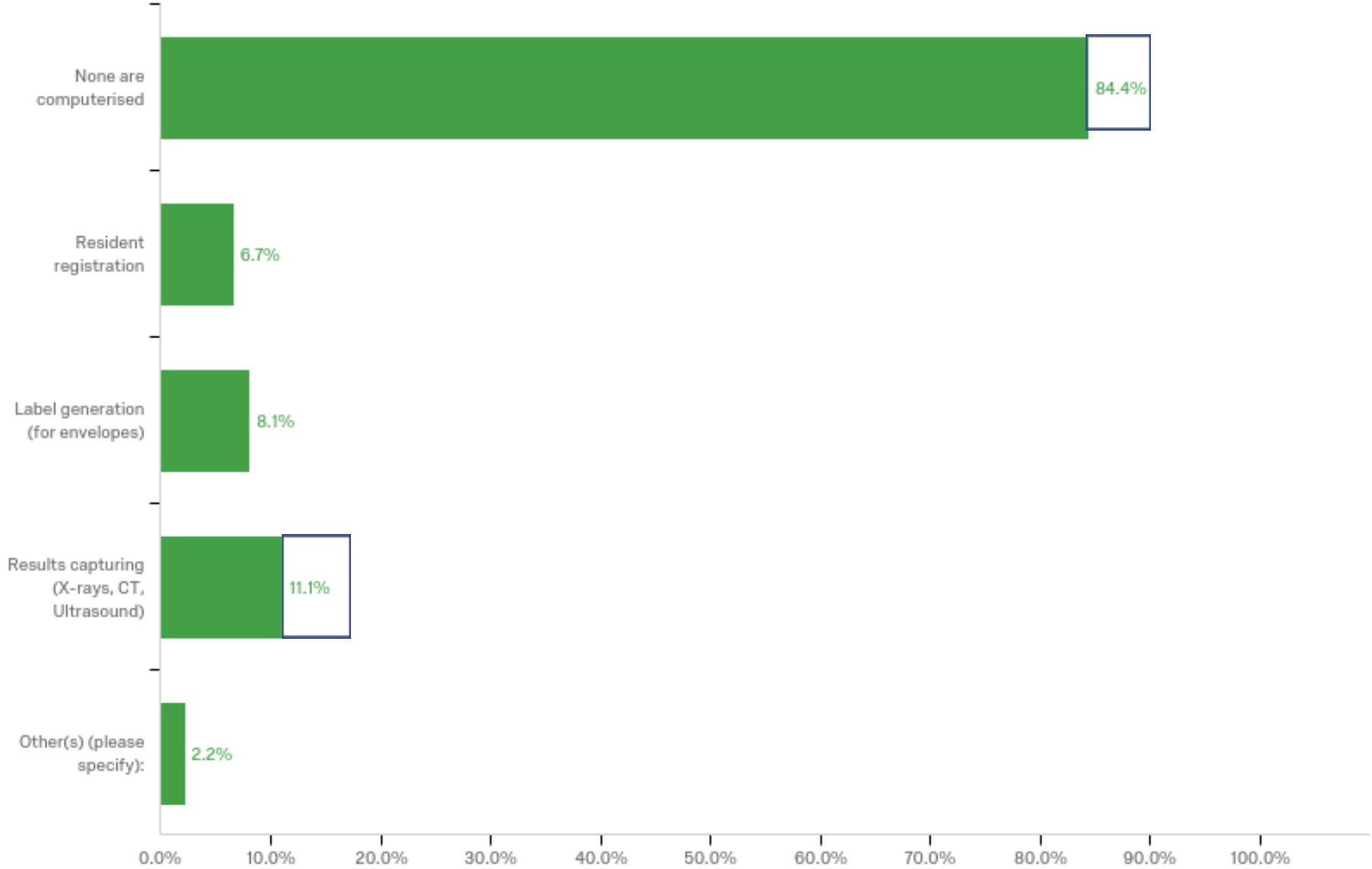
Pharmacy
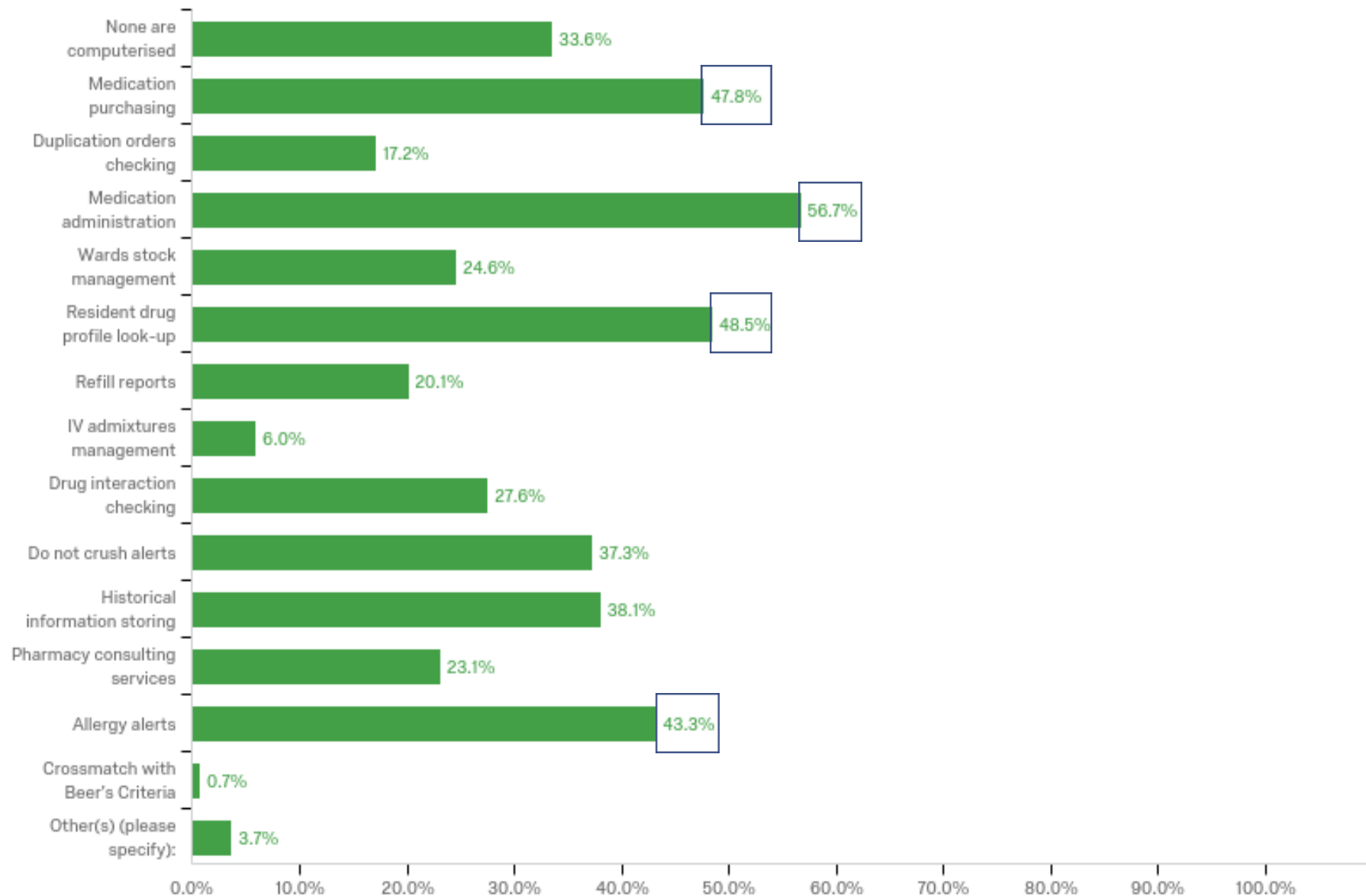
EXTENT OF USE	Not available (%)	Barely used (%)	Somewhat Used (%)	Extensively Used (%)
Resident Administration				
Electronic documentation of medical records throughout the aged care facility	12.4	1.4	8.0	78.1
Electronic documentation of resident identification	8.0	0.0	5.1	86.8
Scanning of medical records to make them available online	27.8	13.9	19.0	39.5
Centralised scheduling system	35.0	5.8	18.2	40.8
Resident Care Activities – Physician				
Dictation (audio) system for Doctors' notes into medical records	97.1	2.9	0.0	0.0
Voice recognition system for Doctors' notes transcription	97.8	2.2	0.0	0.0
Connection to external databases	58.9	11.8	18.4	11.1
Decision support used by clinicians	64.9	15.3	12.2	7.6
Expert systems (e.g. residents use to enter their personal medical history by answering a set of questions	86.1	7.3	0.7	5.9
Telemedicine for evaluation of residents and pre-transfer Arrangements	75.2	10.2	10.2	4.4
Access to radiologic images via workstations / web browser	74.2	9.5	11.0	5.1
Telemedicine for transmission of diagnostic images and/or consultations and second opinions	81.0	6.6	8.8	3.6
Clinical decision support system	70.8	11.7	11.6	5.8

EXTENT OF USE	Not available (%)	Barely used (%)	Somewhat Used (%)	Extensively Used (%)
Resident Care Activities – Nursing				
PCs or workstations at the nursing station	3.6	4.3	6.5	85.4
PCs or workstations in the hallways	73.1	4.5	3.7	18.6
PCs or workstations on the med cart	44.4	2.2	0.7	52.6
PCs or workstations at the bedside	77.0	14.8	5.9	2.2
Portable computing devices used (e.g., hand-held computers, laptops, tablets, smart phones)	38.2	17.0	18.4	26.4
Touch screens	58.7	7.2	11.1	23.0
Resident Care Activities - PT/OT				
PCs or workstations at the nursing station	10.9	7.3	6.5	75.2
PCs or workstations in the hallways	77.6	6.0	4.4	11.9
Portable computing devices used (e.g., hand-held computers, laptops, tablets, smart phones)	55.1	18.4	5.2	21.3
Touchscreens	68.9	12.6	5.2	13.4

EXTENT OF USE	Not available (%)	Barely used (%)	Somewhat Used (%)	Extensively Used (%)
Clinical Support – Lab				
Electronic coding for lab specimens	97.8	0.7	0.7	0.7
Electronic requisitions for laboratory tests by aged care facility	97.8	0.7	0.7	0.7
Electronic reporting of test results to aged care facility	76.4	2.2	13.2	8.1
Electronic transmission and reception of results for interpretation	79.4	2.9	10.3	7.3
Clinical Support – Radiology				
Picture Archive Communications System (PACS)	96.3	0.0	2.1	1.4
Electronic coding (for envelopes management, films, etc.)	97.1	0.0	1.5	1.4
Electronic requisitions for tests	97.8	0.7	0.7	0.7
Voice recognition system for results transcription	100.0	0.0	0.0	0.0
Digital ("filmless") radiologic images	91.1	2.2	0.7	5.9
Access to radiologic images via workstation / web browser	92.6	1.5	3.7	2.2
Telemedicine for results capturing an interpretation by radiologists	98.5	0.7	0.7	0.0
Clinical Support - Pharmacy				
Electronic Data Interchange links to medication suppliers	46.0	1.5	2.2	50.3
Extranet links to medication suppliers	68.6	2.2	2.2	27.0
Remote order entry for medications from clinical units	67.1	0.7	0.7	31.3
Remote order entry for medications from locations outside of the aged care facility (e.g. doctor access from home, office or clinic)	84.7	4.40	0.7	10.2

EXTENT OF INTEGRATION

	Not available (%)	Barely used (%)	Somewhat Used (%)	Extensively Used (%)
Resident Care Activities - Physician				
Medical or resident records are computerised in your aged care facility	10.9	2.2	7.3	79.6
Resident care systems are able to interface with external entities' computerised systems (e.g., clinics, clinical laboratory, hospitals, other aged care facilities, etc.)	75.2	16.7	3.6	4.4
Resident care systems are integrated with other computerised laboratory systems internally in your aged care facility	80.2	9.6	3.0	7.3
Resident care systems are integrated with other computerised PT/OT systems internally in your aged care facility	61.3	10.9	3.7	24.0
Resident care systems are integrated with other computerised dietary systems internally in your aged care facility	65.0	10.9	5.9	18.3
Resident care systems are integrated with pharmacy computerised systems internally in your aged care facility	41.2	1.5	16.9	40.4
Resident care systems are integrated with human resources computerised systems internally in your aged care facility	60.6	4.4	11.7	23.3
Resident care systems are integrated with finance computerised systems internally in your aged care facility	33.8	15.5	5.2	45.6

EXTENT OF INTEGRATION	Not available (%)	Barely used (%)	Somewhat Used (%)	Extensively Used (%)
Resident Care Activities - Nursing				
Nursing information systems are integrated in your aged care facility	21.9	3.7	9.4	64.9
Nursing information systems are integrated with pharmacy information systems in your aged care facility	38.7	6.6	7.3	47.4
Nursing information systems are integrated with dietary information systems in your aged care facility	43.7	7.4	10.3	38.5
Nursing information systems are integrated with PT/OT information systems in your aged care facility	42.9	3.7	9.6	43.7
Nursing information systems are integrated with laboratory information systems in your aged care facility	76.5	14.0	3.0	6.6
Resident Care Activities - PT/OT				
PT/OT systems are integrated to other information systems (pharmacy, laboratory, nursing)	47.5	10.9	17.6	24.1
Patients/Patient's Representative Technology				
Patients or their representatives use of Electronic Health Records	82.7	10.3	6.9	0.0
Patients or their representatives use of Personal Health Records	75.8	13.8	10.3	0.0
Patients or their representatives use of a Health Information Exchange Network	82.7	6.8	10.3	0.0
Patients or their representatives use of self-reported data into an Electronic Health Record	64.5	12.9	13.0	9.7

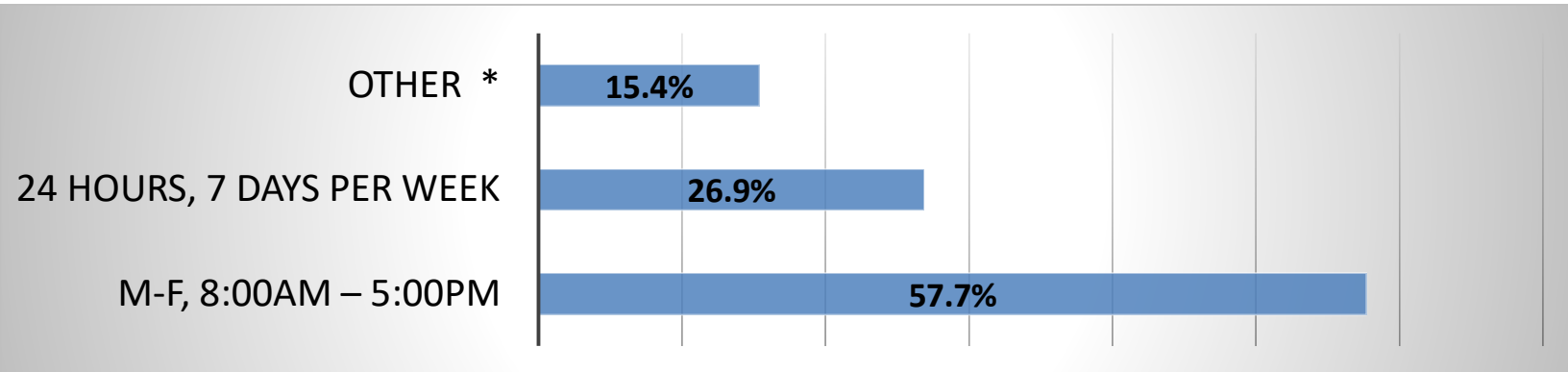| EXTENT OF INTEGRATION	Not available (%)	Barely used (%)	Somewhat Used (%)	Extensively Used (%)
Clinical Support – Lab				
Laboratory systems are integrated with other computerised systems (e.g. nursing) in your aged care facility	92.7	0.7	4.4	2.2
Your laboratory systems are integrated with external entities' (other hospitals, clinics, other aged care facilities, etc.) computerised information systems	94.8	2.2	0.7	2.2
Clinical Support – Radiology				
Radiology systems are integrated with computerised systems in other units (nursing, PT/OT, etc.) in your aged care facility	98.5	0.7	0.0	0.7
Your radiology systems have an interface with external entities' systems (other hospitals, clinics, aged care facilities, etc.)	99.3	0.7	0.0	0.0
Clinical Support – Pharmacy				
Pharmacy systems are integrated with computerised systems in other units (nursing, OT/PT, etc.) in your aged care facility	54.1	1.5	8.0	36.5
Your pharmacy systems have an interface with external entities' systems (e.g., pharmacies, other hospitals, aged care facilities, etc.)	83.9	3.6	0.7	11.7

IT Personnel in the Aged Care Facility
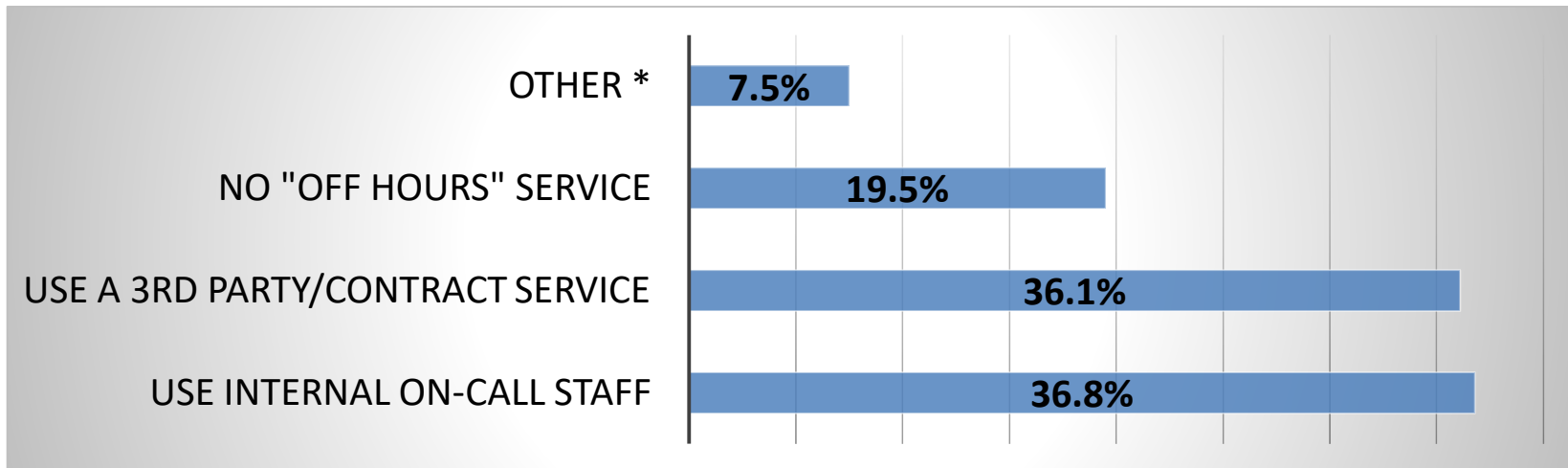## (excluding long-term consultants or sub-contractors)

Legend:
- None
- 1-2
- 3-5
- >5

57.4%
24.3%
11.8%
6.5%
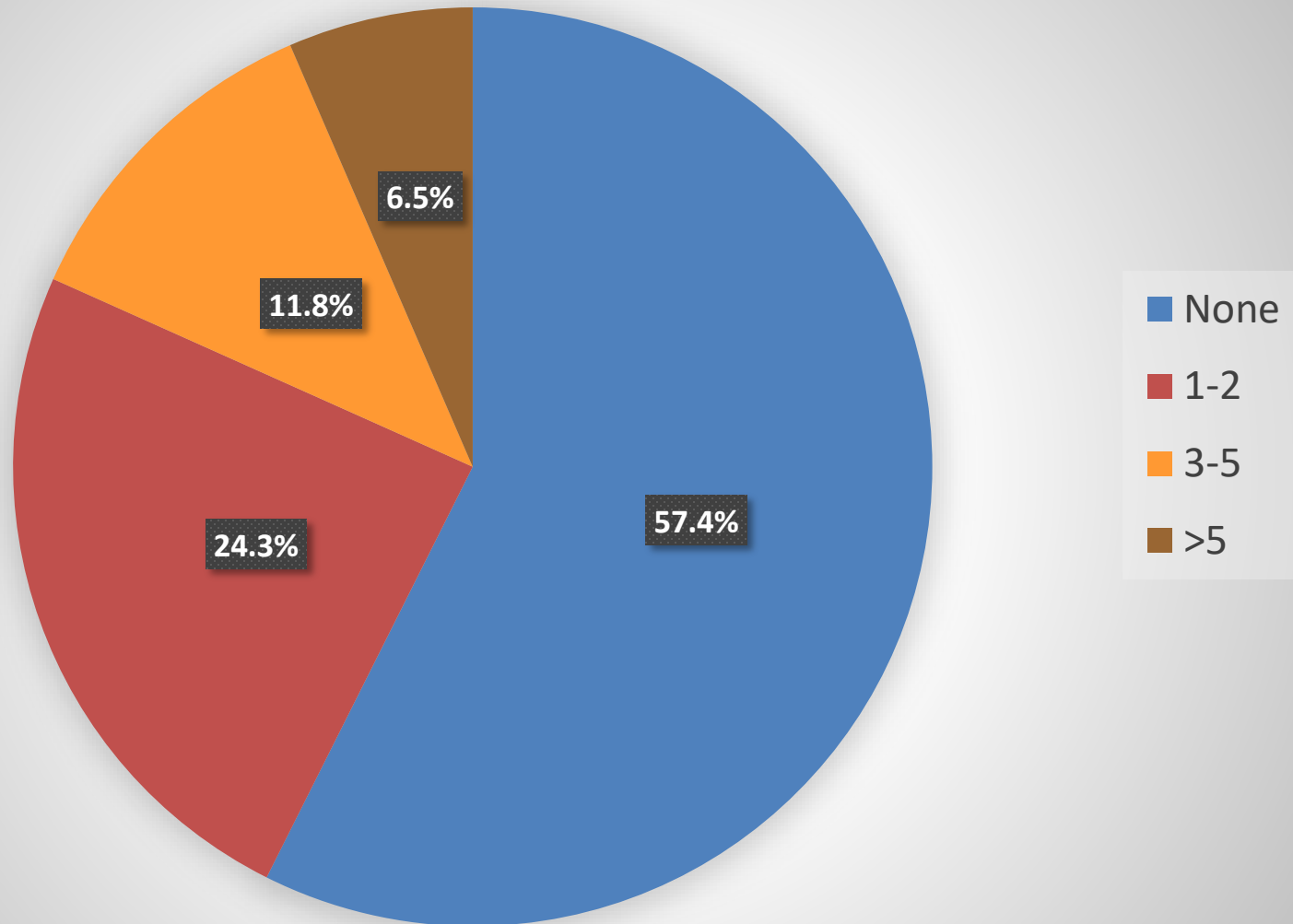
IT STAFFING AND SYSTEMS

Usual hours of IT operations?

OTHER *	15.4%
24 HOURS, 7 DAYS PER WEEK	26.9%
M-F, 8:00AM – 5:00PM	57.7%

* AS NEEDED, M + W 9AM-6PM, 8:30-4, QRS MANAGER IS AN IT CONSULTANT, NOT SURE, LOCATED HEAD OFFICE, 9AM - 5PM HEAD OFFICE ONLY, ALL DONE REMOTE, IT BASED AT CORPORATE OFFICE
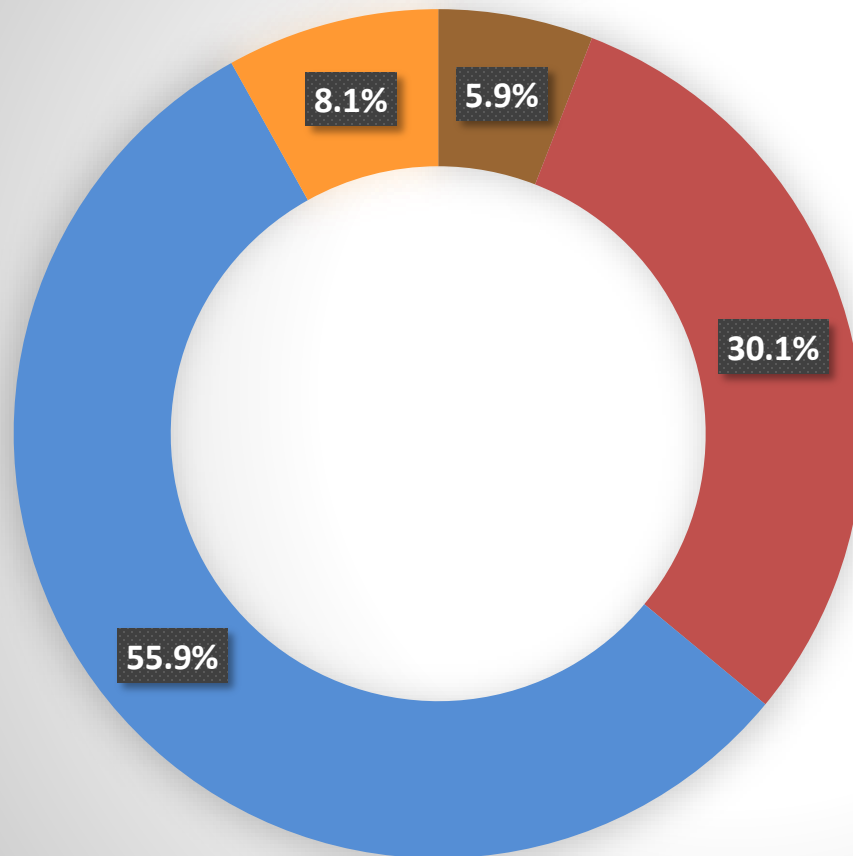
How are "off-hours" IT issues handled?

OTHER *	7.5%
NO "OFF HOURS" SERVICE	19.5%
USE A 3RD PARTY/CONTRACT SERVICE	36.1%
USE INTERNAL ON-CALL STAFF	36.8%

* IT DEPARTMENT IN HEAD OFFICE, CONTRACTOR WILL ATTEND SITE IF REQUIRED, ALL DONE REMOTE, IT BASED AT CORPORATE OFFICE, AFTER HOURS NUMBER AVAILABLE IF NEEDED

ABOUT THE RESPONDENTS

Highest level of Education

Legend:
- High school
- Undergraduate (Bachelor)
- Postgraduate education/degree
- Other *

Chart values: 5.9%, 30.1%, 55.9%, 8.1%

* CERT III, DIPLOMA, DIPLOMA TEACHING, DIPLOMA IN BUSINESS MANAGEMENT, DIPLOMA CERTIFICATE, REGISTERED NURSE HOSPITAL TRAINED, MASTERS (LEADERSHIP/MANAGEMENT/NURSING)

Job Titles

ACTING SERVICE MANAGER
ADMINISTRATION
ADMINISTRATION WARD CLERK
ASSISTANT DIRECTOR CARE SERVICES
ASSISTANT FACILITY MANAGER
BUSINESS MANAGER/RN DWI
CARE DIRECTOR
CARE MANAGER
CARE MANAGER/CLINICAL NURSE
CONSULTANT
CARE SUPERVISER
CEO
CLINICAL MANAGER
CLINICAL NURSE MANAGER
CLINICAL PRACTICE MANAGER
CONTINUOUS QI OFFICER

DEPUTY DIRECTOR OF CARE
DEPUTY SERVICE MANAGER
DIRECTOR CARE SERVICES
DIRECTOR OF NURSING
EDUCATOR
EXECUTIVE CARE MANAGER
FACILITY MANAGER
GENERAL MANAGER
GENERAL MANAGER - IT
GENERAL MANAGER OPERATIONS
IT COORDINATOR
IT SUPPORT
MANAGER
MANAGER OF CARE SERVICES
MANAGING DIRECTOR
NURSE UNIT MANAGER
OPERATIONS MANAGER

QUALITY AND SAFETY COORDINATOR
QUALITY CARE MANAGER
QUALITY COORDINATOR EDUCATOR
QUALITY, RISK AND SAFETY MANAGER
REGISTERED NURSE
REGISTERED NURSE / SYSTEMS MANAGER
REGISTERED NURSE, GENERAL MANAGER
RESIDENTIAL CARE MANAGER
RESIDENTIAL MANAGER
RESIDENTIAL MANAGER/RN
RESIDENTIAL SERVICE MANAGER
SERVICE MANAGER
SERVICE MANAGER / REGISTERED NURSE
SERVICE MANAGER DON
VILLAGE MANAGER

Years in your current position	Years in current aged care facility	Years employed in any IT-related position
Range: 1 month - 43 years	Range: 2 months - 36 years	Range: 0 - 23 years
Average: 7.3 years	Average: 7.6 years	Average: 1.2 years
0-5 years: 82	0-5 years: 76	0-1 years: 93
6-10 years: 28	6-10 years: 18	3-5 years: 4
11-20 years: 21	11-20 years: 29	10-12 years: 4
> 20 years : 6	> 20 years: 7	20 years or more: 3
All 137 responded	7 provided no information	33 provided no information

Key Questions about the Future

1. What are the pattern of changes in overall IT Maturity over time and what links exist between the changes in ITS and NH attributes.

2. Are patterns of overall IT Maturity changes over time associated with changes in Quality Measures over time.

3. Which relationships between specific types of IT Maturity (dimensions and domains), facility attributes (Staffing, Facility, and Market Characteristics), and Quality Measures create the best opportunities for quality improvement.

Thank you

Questions

Contact Information

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