

Contents

List of Contributors ix
Foreword xi
Acknowledgments xiii

I

GETTING STARTED WITH HEALTH INFORMATION EXCHANGE

1. What is Health Information Exchange? 3
BRIAN E. DIXON

Introduction 4
Health Information Exchange 5
Evolution of HIE 11
Models of HIE in the United States 13
HIE Outside the United States 15
Purpose and Structure of this Book 16
Summary 17
Questions for Discussion 17
References 17

2. Health Information Exchange as a Profession 21

CANDACE J. GIBSON, KELLY J. ABRAMS AND TIM PLETCHER

Introduction 22
The Nature of eHealth Professionals: Their
Competencies, Roles, and Work 23
eHealth Professionals—Supply and Demand 25
Skills and Training of eHealth Professionals 27
Defining and Executing a Future Strategy for eHealth
and HIE Professionals 34
Emerging Trends 34
Summary 35
Questions for Discussion 36
References 36

II

ORGANIZATIONAL ASPECTS OF MANAGING HEALTH INFORMATION EXCHANGE

3. Drivers and Barriers to Adoption: Towards
the Last Mile 41

SAURABH RAHURKAR, BRIAN E. DIXON AND
NIR MENACHEMI

Introduction 42
Landscape of the HIE Marketplace 43
Emerging Trends 53
Summary 55
Questions for Discussion 55
References 55

4. Engaging and Sustaining Stakeholders: Towards Governance 59

KEITH W. KELLEY, SUE S. FELDMAN
AND STEVEN D. GRAVELY

Introduction 59
Governing Body 60
Participants 62
Policies and Procedures 62
Data Sharing Agreements 62
Governance Key Success Factors 65
Governance Challenges 65
Regional HIO Governance Example: Indiana Network
for Patient Care 69
State HIO Example: ConnectVirginia 69
Nationwide HIO Governance Example: eHealth
Exchange 70
Emerging Trends 75
Summary 75
Questions for Discussion 75
References 75

5. Managing the Business of Health Information Exchange: Toward Sustainability 77

JOHN P. KANSKY

- Introduction 78
- Sustainability for the Three Forms of HIE Are Different *Business 101* for Health Information Exchanges 79
- Hypothetical Case Study to Illustrate Sustainability 80
- Increasing HIE Revenue 81
- Increasing the Gross Margin Per Service 84
- Reducing Overhead Costs of an HIE Business 86
- Planning for Sustainability 86
- Challenges to Sustainability 88
- Summary 88
- Questions for Discussion 89
- References 89

6. Privacy, Security, and Confidentiality: Toward Trust 91

ERIC THIEME

- Introduction 92
- Federal and State Laws Pertaining to HIE 93
- Contracts 101
- Summary 103
- Questions for Discussion 103
- References 104

III

TECHNICAL ASPECTS OF MANAGING HEALTH INFORMATION EXCHANGE

7. The Evolving Health Information Infrastructure 107

DAVID BROYLES, BRIAN E. DIXON, RYAN CRICHTON,
PAUL BIONDICH AND SHAUN J. GRANNIS

- Introduction 108
- The Health Information Infrastructure 108
- Supporting the Health Information Infrastructure 109
- Open HIE—A Model Health Information Infrastructure 113
- Benefits of the OpenHIE IL 119
- Summary 119

- Acknowledgments 120
- Questions for Discussion 120
- References 120

8. Syntactic Interoperability and the Role of Standards 123

MASOUD HOSSEINI AND BRIAN E. DIXON

- Introduction 124
- Syntactic Interoperability 124
- Health Information Messaging Standards 126
- Developing Standards for Health Care 131
- Resources for Implementers 132
- Emerging Trends 134
- Summary 135
- Questions for Discussion 136
- References 136

9. Standardizing Health-Care Data Across an Enterprise 137

JENNIFER M. ALYEA, BRIAN E. DIXON, JACK BOWIE
AND ANDREW S. KANTER

- Introduction 138
- Role of Terminologies in Health Care 138
- Standard Terminologies in Health Care 139
- Selection of Standard Terminologies for HIE 140
- Current Use of Standard Terminologies 141
- Mapping 142
- Terminology Services 144
- Emerging Trends 146
- Summary 146
- Questions for Discussion 146
- References 147

10. Shared Longitudinal Health Records for Clinical and Population Health 149

DAVID BROYLES, RYAN CRICHTON, BOB JOLLIFFE, JOHAN IVAR
SÆBØ AND BRIAN E. DIXON

- Introduction 150
- Shared Longitudinal Records for Clinical Health 151
- Shared Longitudinal Records for Population Health 152
- Implementation 153
- Emerging Trends 158
- Summary 159
- Questions for Discussion 159
- References 159

11. Client Registries: Identifying and Linking Patients 163

TIMOTHY D. McFARLANE, BRIAN E. DIXON
AND SHAUN J. GRANNIS

Introduction 164
Patient Identifiers 165
Unique Patient Identifiers 165
The Enterprise Master Patient Index 170
The Client Registry 171
Data Quality 173
Metadata and Standards 174
Algorithmic Matching 175
Emerging Trends 179
Summary 180
Questions for Discussion 180
References 180

12. Facility Registries: Metadata for Where Care Is Delivered 183

TIMOTHY D. McFARLANE, SCOTT TEESDALE
AND BRIAN E. DIXON

Introduction 184
Facility Registry Background 184
The Value of FRs 186
Components of an FR 189
FR Functionality 189
Data Specification 190
Creating Unique Identifiers 195
Data Sources for Constructing the MFL 197
An Example From the US Social Security Administration 198
Emerging Trends 199
Summary 199
Acknowledgments 199
Questions for Discussion 199
References 200

13. Health Worker Registries: Managing the Health Care Workforce 203

JENNIFER M. ALYEA, DYKKI SETTLE, CARL LEITNER
AND BRIAN E. DIXON

Introduction 204
Need for Coordinated Health Care Worker Data 204
Health Worker Registries 205
Emerging Trends 208
Summary 209

Application Exercise/Questions for Discussion 209
References 209

IV

THE VALUE OF HEALTH INFORMATION EXCHANGE

14. The Evidence Base for Health Information Exchange 213

WILLIAM R. HERSH, ANNETTE M. TOTTEN, KAREN EDEN, BETH DEVINE, PAUL GORMAN, STEVEN Z. KASSAKIAN, SUSAN S. WOODS, MONICA DAEGES, MIRANDA PAPPAS AND MARIAN S. MCDONAGH

Introduction 214
Methods 214
Results 215
Conclusions 221
Acknowledgments 224
References 224

15. Measuring the Value of Health Information Exchange 231

BRIAN E. DIXON AND CAITLIN M. CUSACK

Introduction 232
The Spectrum of Evaluation 232
Developing an Evaluation Plan 235
Dissemination of Findings 244
Emerging Trends 245
Summary 246
Questions for Discussion 246
References 246

V

THE FUTURE OF HEALTH INFORMATION EXCHANGE

16. Future Directions in Health Information Exchange 251

JULIA ADLER-MILSTEIN AND BRIAN E. DIXON

Introduction 252
Key Challenges Facing HIE and Associated Opportunities for Research and Practice 252

Key Health Care Trends Likely to Impact Long-Term
HIE Focus 259
Conclusion 262
References 263

VI

CASE STUDIES IN HEALTH INFORMATION EXCHANGE

Case Study 1. The Indiana Health Information
Exchange 267

J. MARC OVERHAGE

Major Themes 267
Introduction 267
Background or Context 268
Case Study Main Content 269
Summary 277
Discussion Questions 277
References 278

Case Study 2. Using Health Information
Exchange to Support Public Health Activities
in Western New York: A Case Study 281

SAIRA N. HAQUE, ROBERT BAILEY AND BARBARA MASSOUDI

Major Themes 281
Introduction 281
Background 282
Case Study Main Content 286
Summary and Future Directions 292
Acknowledgments 293
Discussion Questions 293
References 293

Case Study 3. Creating a 21st Century Health
Information Technology Infrastructure:
New York's Health Care Efficiency and
Affordability Law for New Yorkers Capital
Grant Program 295

JOSHUA R. VEST AND ERIKA G. MARTIN

Major Themes 296
Introduction 296

Background: The Health Care Efficiency and
Affordability Law for New Yorkers Capital Grant
Program 297

Case Study: The Evolution of Health Information
Exchange Organizations in New York State 300

Summary and Future Directions 308

Discussion Questions 309

Acknowledgments 309

References 309

Case Study 4. Use of HIEs for Value-Based
Care Delivery: A Case Study of Maryland's
HIE 313

HADI KHARRAZI, DAVID HORROCKS AND JONATHAN WEINER

Introduction 313

Value-Based Care and Accountable Care
Organizations 315

Role of Maryland's HIE in Value-Based Care 320

Conclusion/Summary 328

Discussion Questions 329

References 329

Case Study 5. Health Information Exchange—
The Value Proposition: A Case Study of the
US Social Security Administration 333

SUE S. FELDMAN

Major Themes 334

Introduction 334

Background and Context 339

Case Study Main Content 341

Summary 345

Acknowledgments 346

Discussion Questions 346

References 347

Index 351