Illustrations

Tables

Table 3.1	Richmond's Seven Skills of Systems Thinking	42
Table 3.2	Capra's Six Principles of Ecology	44
Table 3.3	Core Areas Examined by ISIS and Goals	48
Table 3.4	Framework of Integration and Implementation Sciences	49
Table 4.1	Four Functions of Classical Management Theory and Descriptors	65
Table 4.2	Systems Organizing Methods by Principle	84
Table 6.1	Ratings of Political and Financial Climates for 10 States in 2002	172
Table 7.1	Integrated Concepts of Knowledge Management and Translation	
Table 7.2	4P-Knowledge Management and Translation Strategy Map	198
Table 7.3	Strategy Map for Knowledge Management and Translation	100
Table 7.4	Infrastructure	
Table 7.5	Example of Detailed Knowledge Management and Translation Strategy	201
14010 1.0	Checklist for Cancer Control PLANET: One Knowledge Resource Being	
	Deployed in Tobacco Control	210
Table 7.6	Example of Knowledge Management and Translation Strategy and	
	Outcome Map for Tobacco Control, Based on Resources for Tobacco	
	Control Knowledge and Potential Linkage to Desired Outcomes	211
Table 7.7	Categories for Knowledge Base Taxonomy and Related Clusters from	
	Concept Mapping	213
Table 7A.1	Example of Detailed 4P-Knowledge Management and Translation	
	Strategy Checklist for Production of Particular Type of Knowledge	
Table 7A.2	Example of Knowledge-Outcome Map	220
Table 8.1	Examples of Recent Systems Efforts in Tobacco Control	
Table 8.2	Common Methodological Elements across ISIS Systems Approaches	
Table 8.3	Initial Conclusions about Directions for Systems Thinking	233
Table B.1	Steps for Implementation of Conclusions in Specific Stakeholder Groups	271
Figures		
Figure 1.1	Model of Stakeholder Groups and Systems Approaches in Tobacco Contro	ol 3
Figure 2.1	ASSIST Interventions and Delivery Channels	23
Figure 2.2	Multiple Variables Affecting Tobacco Control and Its Outcomes	
Figure 3.1	Combining ISIS Approaches for Applications	49
Figure 4.1	Continuum from Traditional Management to Systems Organizing	66
Figure 4.2	Systems Organizing Model	66

Figure 4.3	Optimal Placement of Tobacco Control Initiatives in the Continuum	
	of Traditional and Systems Approaches	68
Figure 4.4	Elements of Evaluation Framework	82
Figure 4.5	Final Interpreted Concept Map	88
Figure 4.6	Cluster Rating Map	89
Figure 4.7	Pattern Match for Relationship of Cluster Averages for Importance	
	Versus Feasibility	90
Figure 4.8	Pattern Match for Degree of Consensus between Practitioners	
S	and Researchers on Average Importance Ratings	90
Figure 4.9	Bivariate Go-Zone Plot of Importance and Feasibility Ratings of	
	Practitioners, for Diffusion/Dissemination Cluster	91
Figure 4.10	Concept Map Showing Clusters, Cluster Labels, and Interpretations	
	of Dimensions and Regions	93
Figure 4.11	Cluster Average Ratings of Responsibility	94
Figure 4A.1	Final Cluster-Rating Concept Map for Strategic Planning	
Figure 4A.2	Pattern Matching Ladder Graph of Degree of Consensus between	
	Importance Ratings for Groups A and B for Concept Map in Figure 4A.1	102
Figure 4A.3	Go-Zone Plot of Feasibility Versus Importance for Methodology Cluster	
	in Concept Map (Figure 4A.1)	103
D'		
Figure 5.1	Feedback Loops in a System Dynamics Model	114
Figure 5.2	Sample of Graphs on Tobacco Use Factors from Expert Participants at	110
D: - 50	2003 Conference on ISIS	118
Figure 5.3	Causal Map Segment, Incorporating Social Norm and Tobacco	110
D' 4 5 /	Grower Factors.	119
Figure 5.4	Expanded Causal Map Segment, Incorporating Awareness of Tobacco	100
D' 4 5 5	Health Risk	
Figure 5.5	Causal Map Adding Impact of Antitobacco Constituencies	
Figure 5.6	Causal Map Adding Government Awareness of Tobacco as a Health Risk	
Figure 5.7	Causal Map Adding Impact of Protobacco Constituencies	122
Figure 5.8	Causal Map Adding Impact of Greater Willingness to Legislate	100
D: - 5.0	Tobacco Control	123
Figure 5.9	Causal Map Adding Impact of Government Tax Revenues and Funding	10%
D: - 5.10	for Tobacco Control	124
Figure 5.10	Final Causal Map of System Dynamics Model for Tobacco Control in the	105
D'	Initiative on the Study and Implementation of Systems	
Figure 5.11	Model of Public Opinion Factors	
Figure 5.12	Model of Aging Chains of Smokers (Birth to Death)	
Figure 5.13	Model of Research and Dissemination Factors	
Figure 5.14	Model of Government Sector	
Figure 5.15	Expanded Model of Public Opinion Factors	131
Figure 5.16	Model Data Versus Actual Data on Population Fractions of Current and	100
D' 4 5 15	Former Smokers	
Figure 5.17	Stock Values for Public Opinion over Time (Baseline)	
Figure 5.18	Feedback Loops Affecting Public Opinion	
Figure 5.19	Feedback Loops with Change in Feedback Levels	133

Figure 5.20	Effect of Public Opinion on Adult Uptake	. 134
Figure 5.21	Effect of Public Opinion on Rate of Smoking Cessation among Adults	135
Figure 5.22	Causal Loops for Public Opinion and Support of Tobacco Control	136
Figure 5.23	Effect of Public Support for Tobacco Control on Research Fraction	136
Figure 5.24	Causal Map for Research and Public Support for Tobacco Control	.137
Figure 5.25	Effect of Research on Tobacco Use	.137
Figure 5.26	Effects of Translated Research on Public Opinion	138
Figure 5.27	Effects of Translated Research on Undecided Public	138
Figure 5.28	Percentage of Undecided Public over Time	139
Figure 5.29	Effect of Research on Population Fraction of Smokers	139
Figure 5.30	Effects of Government Intervention on Shift from Support for Tobacco	
	Control to Undecided and from Undecided to Support for Tobacco Use	.140
Figure 5.31	Effect of Government Intervention on Public Supporters of Tobacco Control	140
Figure 5A.1	Tobacco Use Sector	
Figure 5A.1	Tobacco Research and Education Sector	
Figure 5A.2	Government Sector	
Figure 5A.4	Public Opinion Sector	
riguit JA.4		.140
Figure 6.1	Contact Networks for Two States with Strong Financial and Political	
	Climates	173
Figure 6.2	Contact Networks for Two States with Weak Financial and Political	
	Climates	
Figure 6.3	Role of Informal Interactions in Referral Patterns	174
Figure 6.4	Change in Tobacco Control Program Funding for Indiana from 2002 to	
D. 0.5	2004	.175
Figure 6.5	Change in Perceived Political Support for Tobacco Control from Two	
	Indiana Governors, Governor Frank O'Bannon (2002) and Governor	170
D' • C C	Joseph Kernan (2004)	.176
Figure 6.6	Change in Indiana's Tobacco Control Contact Network Structure from	170
	2002 to 2004	.170
Figure 7.1	Overview of a Knowledge Management and Translation Framework for	
	the Health System	.189
Figure 7.2	Conceptual Framework for Knowledge Management	
Figure 7.3	Conceptual Framework for Knowledge Translation	.192
Figure 7.4	Integrated Knowledge Management and Translation Strategy Framework	.195
Figure 7.5	4P-Knowledge Management and Translation Infrastructures Strategy Map	199
Figure 7.6	4P-Knowledge Management and Translation Strategy Maps: Templates	
	for Knowledge Resources Needed in Tobacco Control	
Figure 7.7	Cluster Rating Map for Tobacco Knowledge Base	.212
Figure 7.8	Pattern Matching to Compare Importance of Cluster Ratings in	
	Demographic Subgroups of Participants	
Figure 7A.1	4P-Knowledge Management and Translation Infrastructures Strategy Map	.218
Figure 7A.2	Detailed Knowledge Management and Translation Strategy Map:	
	Template for 4P-KMT and KMT Infrastructures	.219

Figure 7A.3	Example of Template for Detailed 4P-Knowledge Management and	
	Translation Strategy Map for Production, Use, and Refinement of	
	Particular Type of Knowledge	219
Figure 7B.1	Knowledge Management and Translation Framework in Health	222
Figure 8.1	Trends over Time in Tobacco Control Strategy and Methodology	228
Figure A.1	Evolution of Tobacco Control Approaches toward Systems Thinking	250
Figure B.1	Common Framework for Integrating Systems Approaches	266
Figure B.2	Integrated Approach that Benefits Scientists and Practitioners	268
Figure B.3	Tailoring of Integrated Approaches to Specific Applications	269