

TABLE OF CONTENTS

LIST OF TABLES	v
LIST OF FIGURES	vii
CHAPTER	
1 INTRODUCTION	1
2.1 Hospital Acquired Infections	3
2.2 Contact Network Epidemiology	4
2.3 Random Graph Models for Contact Networks	7
2.4 Vaccination Policies	9
2.5 Disease Surveillance	11
2 GENERATING HCW CONTACT NETWORKS	15
2.1 Constructing HCW Contact Networks	15
2.1.1 The Hospital Graph	17
2.1.2 Extracting contacts	20
2.1.3 HCW contact networks: discussion	22
2.2 Computers-People Graph	24
2.3 Analysis of HCW Contact Networks	25
2.3.1 Degree Distributions	26
2.3.2 Community Structure	29
2.3.3 Small World Property	31
2.3.4 Diversity within Groups of Healthcare Workers	32
2.3.5 Discussion	34
3 RANDOM GRAPH MODELS OF CONTACT NETWORKS	36
3.1 Chapter Overview	40
3.2 Graph Metrics	41
3.3 Generating Random Graphs	45
3.3.1 Comparison of Graph Properties	49
3.4 Comparing the Spread of Disease	54
3.5 Clustering in Networks	67
3.5.1 Construction-Based Models	71
3.5.2 Edge Swapping	79
3.6 Spatial-Clustering Model	90
3.7 Discussion	97