Exploring the Impact of Virtual Medicine on the Patient-Centered Medical Home

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Abstract

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The Patient-Centered Medical Home (PCMH) is a health care delivery model where a patient has an ongoing relationship with a personal physician who provides comprehensive and appropriate health care. Enhanced health care accessibility is one of the desired characteristics in a PCMH, which supports patient access to health care service 24/7, 365 days a year. Virtual medicine, such as secure messages, video diagnoses, and email communications, is one of the general tools used to realize this increased accessibility.

Email communication was the form of virtual medicine studied in this thesis. This thesis explores the impact of email communication on patient visits to different health care services, such as primary care, specialty care, and urgent care. The data was

provided by Group Health Cooperative (GHC) and was divided into two time periods: 2001 – 2004, before email communication implementation at Group Health, and 2009 – 2012, after email implementation. A Markov chain model was used to represent the transition data of patient visit encounters. Three metrics were used to study the impact of email communication: 1) number of patient visit encounters per member per month, 2) steady state probabilities of patient visit encounters, and 3) patient visit frequency to different health care services.

The results indicated that, with email communication, the frequency of combined primary and specialty care visits decreased. This decrease in patient visits is consistent with the results of a study conducted at Kaiser Permanente Northwest (Zhou et al., 2007). The result in this thesis then showed that the decrease in overall visits was dominated by a decrease in primary care visits. The analysis showed an increase in specialty care visits with email communication. Possible causes for these observations are discussed in the thesis.

A generalized, extendable PCMH simulation model was developed. It was used to validate the steady state probabilities calculated from the Markov chain model. A more important contribution of the simulation model is the capability to model limited availability of physician schedules, whereas the Markov chain model assumed infinite capacity of all the health care services.

Dedication

I dedicate my dissertation work to my family, especially my loving parents, who work hard, raise me, and do their best to provide me with a safe, fulfilled growth and education environment.

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Acknowledgements

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1. Introduction

Healthcare in the United States has been plagued by its high cost, inconsistent quality, and fragmented delivery. According to the report from the World Health Organization (WHO) (2011), total healthcare spending in the U.S. was 15.2% of its GDP in 2008, which was the highest in the world. The spending was also 2.4 times higher compared to other developed countries and is bound to rise 67.9% in the next decade (Sisko et al., 2009). In addition to rising costs, additional concerns regard the access to care for 45.7 million uninsured U.S. citizens and the fairness of the Accountable Care Act.

1.1 Research Motivation

The Patient-Centered Medical Home (PCMH) is a health care delivery model advocated by US health care associations and organizations. By offering health care in an "accessible, continuous, comprehensive, coordinated" way, it has drawn rapidly increasing attention in recent years, from both industry and academia (Donaldson et al., 1996).

Compared to other health care delivery systems, the PCMH has six joint design principles. One of them is enhanced access to care, which contributes to removing temporal and geographical restraints. Virtual medicine is the major method to support this characteristic. For example, chronic illness patients receive secure messages about activity instructions and advice. Patients make video meeting appointments for preliminary diagnoses to reduce the number of office visits. Moreover, email communications are now incorporated into many health care system portals to aid patient interaction with their primary physicians.

Many researchers studied the impact of virtual medicine on topics of chronic condition control and patient face-to-face office visit. These studies are discussed in Chapter 2.

1.2 Statement of Problem

Virtual medicine, such as telephone, secure messages, and emails, has been broadly used in current PCMH practices. However, one might ask: does virtual medicine help in the health care delivery system?

It is a complex question because of the large scope of a PCMH. It involves multiple stakeholders who have various incentives to consider. Patients care about health care quality, accessibility, and reimbursement convenience. Insurance companies focus on cost-effectiveness and health care outcomes. Physicians care about their patient treatment and they also want to be assigned reasonable workloads. And policy makers value promotion and implementation feasibility.

Early researchers designed a series of metrics to study the improvement of virtual medicine in the context of PCMH: chronic illness condition control rate; face-to-face office visit counts; and patient reservation waiting time. For example, secure messages have been shown to be effective in diabetes management (Connelly et al., 2013) and virtual patient-physician messaging has helped decrease annual patient office visits at Kaiser Permanente Northwest (Zhou et al., 2007).

However, there are few research studies investigating the impact of virtual medicine on patient visit encounters, especially those in primary and specialty care.

1.3 Research Objectives

This thesis examines patient visit encounters in a PCMH and explores the effect of email communications on the patient encounters, especially those in primary care and specialty care.

To explore the impact of email communications, data was provided by Group Health Cooperative covering two time periods: before and after email implementation. A Markov chain model was constructed to analyze the frequency of patient visit encounters, before and after email implementation.

The capacity and scheduling of each type of health care service was not captured in the Markov chain model. Therefore, another objective was to develop a model that included waiting time for patients to see a health care provider due to care provider capacity constraints. An extendable simulation model was created that could estimate patient waiting time—the time patients must wait before their next visit encounter—that is, the future appointment with a health care service (e.g., primary care).

2. Literature Review

The following section provides a review of PCMH evolution, primary care in PCMH, and the application of simulation modeling health care system.

2.1 Patient-Centered Medical Home

Patient centeredness of health care delivery has been proved to be successful in the form of health care in many practices (Frampton et al., 2008). As chronic diseases have become one of the most challenging burdens in health care, patient-centered health care is needed as a more responsive pattern to individual patient preferences, needs, and perspectives to ensure that patient values guide clinical decisions.

In retrospect, the origin of the terminology "medical home" first appeared in the 1960s edition of the book *Standard of Child Health Care*, published by the American Academy of Pediatrics (AAP) (2008). It was defined as a centralization of children's pediatric health records, designed in response to special health care needs. The initial intention of this idea was to reduce duplications and gaps in health care services. However, it was not until 1970's that the AAP began to address the policy implication of the term "medical home." The AAP council developed a policy statement that "delays, gaps, duplications, and diffused responsibilities which characterize fragmented care are expensive, inefficient, and sometimes hazardous to health." In 1977, the AAP Board of Directors agreed on terminology for an official policy regarding the concept of a medical home as "…when all the child's medical data are together in

one place (medical home) readily accessible to the responsible physician or physicians." However, the focus was still on physical location of patient records.

In 1992, the AAP published its first policy statement defining the medical home (American Academy of Pediatrics, 1992). For the first time, the policy went beyond the historical focus on location of records and expanded the characteristics as an ecological approach to medicine. The AAP stated that the medical care of infants, children, and adolescents ideally should be "accessible, continuous, comprehensive, family-oriented, coordinated, and compassionate." It should be delivered or directed by a well-trained physician who is able to manage or facilitate essentially all aspects of pediatric care. The physician should be known to the child and family and should be able to develop a relationship of mutual responsibility and trust with them (The Medical Home, 2002).

The PCMH is oriented to achieve patient-centered care delivery. In order to formally establish the guidance of PCMH model, a joint policy statement about PCMH principles were put forth in 2008 (American Academy of Family Physicians, 2008). It is described in detail in Table 1.

Table 1: Joint Policy Statement: Patient-Centered Medical Home Principles (American Academy of Family Physicians, 2008)

Fundamental Principles	**Descriptions**
Personal Physician	• Patients have an ongoing relationship with a personal physician • First contact, continuous and comprehensive care

Whole-Person Orientation	• Medical home provides for all the patient's health care needs or appropriately arranges care with other qualified professionals • Care for all stages of life: acute care, chronic care, preventative services, and end-of-life care
Physician Directed Medical Practice	• Personal physician leads a team of individuals at the practice level • Collective responsibility for the ongoing care of patients
Care is Coordinated and/or integrated	• Coordination of care across the health care system and patients' community • Care is facilitated by registries, information technology, health information exchange, use of interpreters, and other means
Quality and Safety	• Quality and safety improvements are hallmarks of the medical home • Specific activities could include individualized care plans, evidence-based decision support tools, collection and reporting of quality improvement data, use of information technology, and voluntary certification of practices as medical homes
Enhanced Access	• Patients can easily access their health care via their medical home • Specific improvements could include open access scheduling, expanded hours and enhanced phone or email communication
Payment	• Increased payments support the added level of service and value provided to patients who receive care from a medical home

In recent years, public and private payers, health care delivery organizations, and governments have joined in the PCMH transformation following these guidelines and many of them have contributed to completing the instructions on PCMH practice implementation (Backer, 2007; Crabtree et al., 2010; Reid et al., 2009).

2.2 Application of Virtual Medicine in Healthcare

Virtual medicine, also referred to as virtual care, is a new way to deliver health care through information technologies. It aims to provide affordable and accessible health care, based on rapid accessibility and online collaboration with physicians and patients.

In the report from the Institute of Medicine (Institute of Medicine, 2001), six qualities aiming for health care system development are proposed. One of them is to propel a continuous healing system, which implies that health care delivery system should be responsive at all times and that access to care should be provided over the Internet, by telephone, and by other means in addition to face-to-face visits.

Virtual medicine is a proven tool to enhance this accessibility. Video diagnoses enables preliminary consultations, saving from geographical restrictions. Email communications and secure messages can provide asynchronous health care service. Virtual medicine is platform-independent. Physicians in an Emergency Department may need to have access from a webcam on a desktop computer, while a hospitalist may just need virtual access from a smartphone or tablet to receive care delivery instructions. Nowadays, mobile phones, text messages, websites, emails, and computer-learning-based technologies are widely applied as a health care delivery method in PCMH practice, to support interactions and diagnoses.

Related benefits of virtual medicine are thoroughly discussed in previous research. From the perspective of patients or health care consumers, effectiveness of information intervention was confirmed on promoting health care outcome (physical activity) in diabetes treatment

(Connelly et al., 2013); Other studies inspected the outcome of information and communication technologies utilization for health professionals (Gagnon et al., 2010). There are also projects which describe the effectiveness of mobile health (M-Health). Topics include applying mobile computing and communication technologies in various fields in health care, such as supporting management of chronic disease, smoking cessation, body weight loss, and reducing alcohol consumption (Free et al., 2013; Mahmud et al., 2010).

However, there are still many uncertainties concerning how these virtual communications affect the health care system in detail. For example, Zhou et al. (2007) indicated a decreased number of annual office visits in the study of Kaiser Permanente Northwest after introducing secure patient-physician messaging as a portal tool. However, portal users at Kaiser Permanente Colorado had more office visits during the year following portal registration (Palen et al., 2012). Telephone encounters were verified to be substitutions for follow-up visits at a Veterans Health Administration clinic (Wasson et al., 1992). However, McKinstry et al. (2002) found that email consultations have not decreased general practitioners' workload. Moreover, information intervention was proved to be effective in diabetes management (Connelly et al., 2013). But it is also discussed that alert fatigue and information chaos, a result of frequent or repetitive information delivery, can have a negative effect on recalling emergency information for health care providers (Baseman et al., 2013).

In general, although participation of information technologies as communication tools in patient-centered health care system is usually viewed as positive and promising, the conclusion requires more validation and support.

2.3 Simulation Modeling in Healthcare

Simulation modeling is one of many different analysis methods to estimate the performance of a health care system. It is traditionally proposed to compare alternative scenarios and visualize workflows to help make the most beneficial decisions. Techniques like Discrete-Event Simulation (DES), System Dynamic Simulation (SDS), and Agent-based Modeling are widely used as simulation approaches in health care.

The history of simulation modeling in health care can be tracked back to the 1960's. Günal and Pidd (2010) reviewed modeling approaches in health care and the efforts in implementing simulation models and summarized that the models were ineffective due to computing power limitations. Other barriers to implementation included the lack of incentives, missing quantifiable data, no vested authority, and no commitment to follow-up. In the 1980's, operations research was applied in health care, leading an advance of balancing the conflicting objectives of physicians, nurses, hospital managers, and other health care professionals (Smith-Daniels et al., 1988). It expanded the influence of simulation modeling from the health care operations level, to higher managerial ones.

After years of exploration, the scope of simulation modeling in health care was gradually formed into four main categories (Barjis, 2011). Each category requires a balance

between simplicity and complexity, to present a generic concept and to include enough details to increase the model confidence as well. The four categories are:

1. Clinical Simulation: simulation is mainly used to study, analyze, and replicate the behavior of certain diseases including biological processes in human body.
2. Operational Simulation: simulation is mainly used for capturing, analyzing, and studying health care operations, service delivery, scheduling, health care business process, and patient flow.
3. Managerial Simulation: simulation is mainly used as a tool for managerial purposes, decision making, policy implementation, and strategic planning.
4. Educational Simulation: Simulation is used for training and educational purposes, where virtual environments and virtual and physical objects are extensively used to augment and enrich the simulation experiment.

DES models the operation of a system as a discrete sequence of events in time. Each event occurs at a particular instant in time and marks a change of state in the system. It has a broad application in health care, including resource allocation, planning, scheduling, and policy strategy evaluation (Fone et al., 2003; Mustafee et al., 2010) and performance modeling (Günal & Pidd, 2010). Jacobson et al. (2006) provided a comprehensive review of health care applications of DES under two headings: patient flow and healthcare asset allocation. In addition, DES modeling has also been applied in health care clinics. Relevant areas include patient scheduling and admissions, patient routing and flow schemes, scheduling and availability of resources, and

allocation of resources (bed sizing and planning, room sizing and planning, staff sizing and planning) (Jun et al., 1999).

3. Methodologies for Exploring Virtual Medicine in PCMH

This chapter presents the methodologies used in this thesis to explore the impact of virtual medicine in a PCMH practice. The data source, patient visit encounter analytical methods, and simulation modeling processes are described.

3.1 Data from Group Health Cooperative

This thesis was assisted by Group Health Cooperative, a health care financing and delivery organization in Washington and Idaho. Group Health provides health care coverage to over 700,000 members. The data was recorded at 20 Group Health owned facilities and more than 500 Group Health primary and specialty care physicians' offices. In addition, Group Health achieved a complete email communication implementation in 2005, which gave a clear distinction between pre- and post-email communication in terms of virtual medicine.

The data for this thesis was first partitioned into two time periods: 2001 to 2004, which was before email communication was introduced to the system, and 2009 to 2012, which was after email implementation.

The data was then further categorized into different groups by two other factors: patient age and chronic condition. Patient age groups were divided in a way that is commonly used in prevention guidelines: age 18 to 39, age 40 to 64, and age 65 and up. Chronic condition is an alteration in the structures or functions of the body that is likely to last longer than twelve months and is likely to have a negative impact on health or functional status (Weiner & Abrams, 2009). Three chronic condition groups were used in this study: 0, 1, and 2. They

represent the number of unique chronic Expanded Diagnosis Clusters (EDCs) flags presented in the individual's diagnosis history. In other words, the greater the chronic condition count, the more severe the chronic condition of the patient. Details about EDCs and population marker information can be found in the John Hopkins ACG System Technical Reference (Weiner & Abrams, 2009). Patients in chronic condition group 0 had zero EDC flags; patients in chronic condition 1 had one EDC flag; and patients in chronic condition group 2 had two or more EDC flags. In summary, the data in this thesis was divided into 18 categories (three age groups, three chronic condition groups, and two time periods).

Table A.1 in Appendix A includes the number of enrolled members, average months enrolled, standard deviation of months enrolled, and the number of member-months for each of the 18 categories. This information is used in the data analysis for scaling purposes.

Table 2: Twelve Health Care States

Health Care States	Abbreviation
1. Other/Not Applicable	NA
2. Primary Care	PC
3. Specialty Care	SC
4. Urgent Care	UC
5. Hospital	Hos
6. Emergency Department	ED
7. Institutional Stay	IS
8. Radiology	R
9. Email	E
10. Lab	Lab
11. Telephone	Tel
12. Pharmacy	P

The patient visit encounter is the basic unit recorded in the dataset. A health care state represents a certain type of health care service. There are twelve types of health care services in the data used for this thesis, including primary care, urgent care, and specialty care. Table 2 lists all of the health care states involved in this thesis.

The flow of patients between health care services was modeled by counting the number of transitions from one state to another. Appendix B provides the number of patient encounters that visited health care state i, for i= 1, 2, …, 12, and next visited health care state j, for j= 1, 2, …, 12, for each of the 18 categories. Each of the 18 data sheets is recorded in a matrix form, with rows representing current health state and columns representing next health care state. To illustrate, Table B.1 in Appendix B is the number of patient visit encounters table for the group of age 18 to 39, chronic condition 0, year 2001 to 2004. The entry in bold, 44331, represents the total number of patient visit encounters that visited specialty care immediately after primary care. The column on the right sums the number of patient visit encounters from each state. For example, in Table B.1, 1325966 in bold indicates there were a total of 1,325,966 patient visit encounters that transitioned out of primary care.

Appendix C describes the transition probability of a patient visit encounter between current health care state i, for i = 1, 2, …, 12 and next health state j, j = 1, 2, …, 12. Table C.1 is the data for the group of age 18 to 39, chronic condition 0, year 2001 to 2004. The entry in bold 3.34 represents that the transition probability for a patient visit encounter from current health care state of primary care to the next health care state of specialty care is 0.0334. It is obtained by

dividing the number of patient visit encounters transitioning from primary care to specialty care, which is 44331 in Appendix B.1, by the total number of patient visit encounters transitioning out of primary care, which is 1325966. It can also been understood as 3.34% of total patient visit encounters occurring in the health state of primary care will next transition to the specialty care state.

The transition time, or the time between patient visit encounters, is denoted as T_{ij}, for i = 1, 2, …, 12 and j = 1, 2, …, 12. It represents the mean time between a patient visit encounter from current health care state i to the next health care state j. It is fit with a Gamma distribution and two parameters are used to describe this distribution—shape parameter α and rate parameter β. They are shown in Appendix D.

3.2 Patient Visit Encounter Analysis Using a Markov Chain Model

In this thesis, a Markov chain model was utilized to represent the flow of patients through different health care states. All the health care states are interconnected. The connection between two health care states can be viewed as a possible pathway for a patient visit encounter from one state to an encounter in another state.

Figure 1 illustrates the Markov chain model used in this thesis with twelve health care states. The twelve health care states are listed in Table 2. All of the states are connected, but only the connections among primary care, specialty care, and urgent care are drawn for illustration. In Figure 1, P_{23} represents the probability that a patient visit encounter to primary care (health care state 2) is followed by a patient visit encounter to specialty care (health care state 3). In

Table C.1, the value of P_{23} equals 0.0334 as 3.34%, which was previously discussed as an example in section 3.1. Of the patients that went from health care state 2 to health care state 3, the average time between encounters is T_{23}.

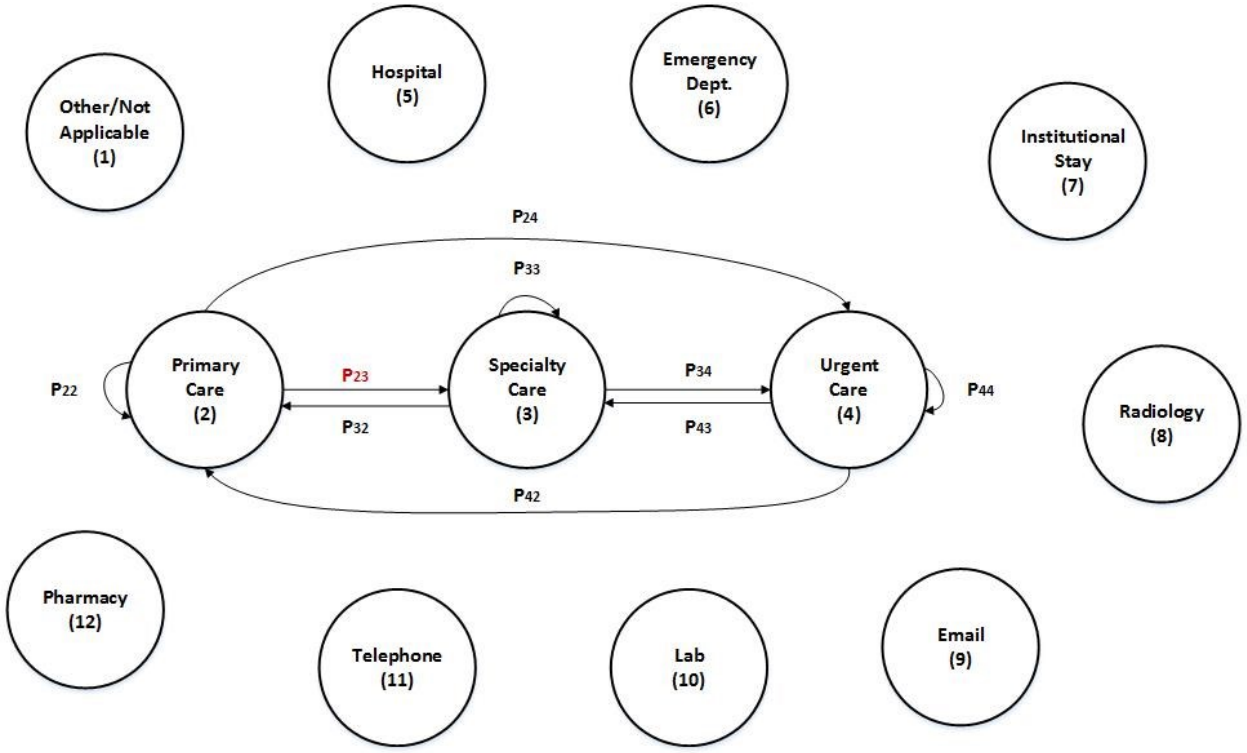

Figure 1: Patient Visit Encounter Markov Chain Model

Three observation metrics are designed to evaluate the impact on patient visit encounters: the number of patient visit encounters per member per month; the steady state probability of a patient visit encounter for health state *i*; and visit frequency for health state *i*, for *i* = 1, 2, …, 12. Each metric is evaluated for each of the 18 categories (two time periods, three age groups, and three chronic conditions). The results are discussed in Chapter 4.

The number of patient visit encounters per member per month is the first metric used in this thesis. "Per Member Per Month" (PMPM) is a fundamental health care financing indicator. It can be used to obtain the ratio of a service or cost divided into the number of members in a particular group on a monthly basis. In this thesis, the number of enrolled member-months from Appendix A.1 functions as the PMPM indicator. The number of patient visit encounters per member per month equals the total number of patient visit encounters divided by the PMPM indicator. It represents how many patient visit encounters an enrolled member will make on a monthly basis.

The steady state probability of a patient visit encounter for state *i*, for $i = 1, 2, \ldots, 12$, is denoted as π_i. The steady state probability π_i of the Markov chain is the proportion of encounters occurring at health care state *i*, after the system has converged. It may be interpreted as the percentage of patient visit encounters to each health care state in the long-run.

The third and primary metric is visit frequency for health state *i*, for $i = 1, 2, \ldots, 12$. It quantifies how many patient visit encounters a member makes per month to health care state *i* in the long-run. It equals the number of patient visit encounters multiplied by the steady state probability of being in health care state *i,* and divided by the number of enrolled members-months:

$$\text{Visit Frequency for health state } i = \frac{Total\ Number\ of\ Patient\ Visit\ Encounters\ \times\ \pi_i}{Number\ of\ Members\ Enrolled\ \times Average\ Months\ Enrolled}$$

3.3 Discrete-Event Simulation Modeling Design

3.3.1 Conceptual Design of Simulation Model

The discrete-event simulation model uses the same states as the Markov chain model and simulates patient visit encounters from state to state.

Simio is the tool used to build the discrete-event simulation model in this study. It is an object-based simulation software. It provides a unique paradigm to allow objects that were designed independently to have complex interactions with each other; it also supports multiple paradigms including object-oriented, process oriented, discrete-event, continuous, and agent-based modeling (Pegden, 2012).

One distinction between the simulation model and the Markov chain model is that the health care states in the simulation model have limited capacities, whereas in the Markov chain model, the capacity information of heath care states is not represented. In reality, health care states can be largely different in terms of capacity. Health care states, such as emergency department, email communication, and pharmacy, do not have capacity concerns. For example, if the emergency department in one hospital is full, patients can be transferred to nearby hospitals for health care services. However, for primary care and specialty care, patients are prone to wait if all of their familiar or expected physicians' schedules have been filled. By assigning health states different capacities, the simulation model provides a view of patient waiting time under conditions of different physicians' availabilities.

3.3.2 Structure Description

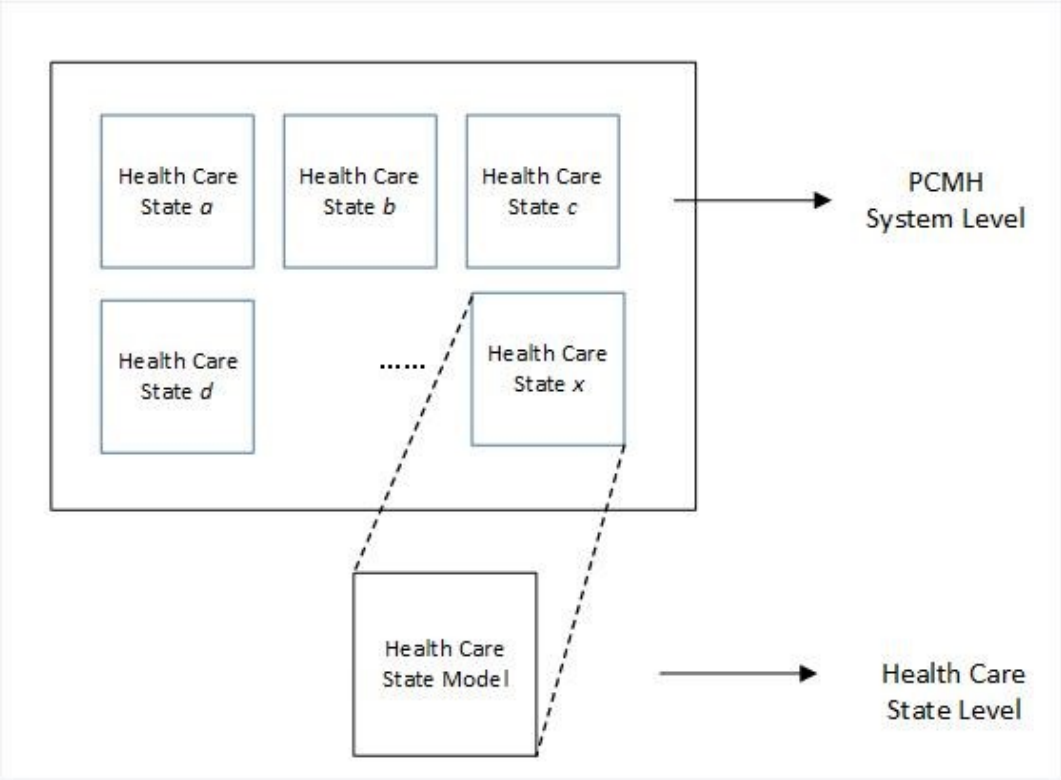

Figure 2: Simulation Model Structure

The simulation model was structured using a bottom-up system building approach. Individual base elements of the system are first specified before these elements are combined together to form larger subsystems. These subsystems will then be linked to form a top-level system (see Figure 2). In this model, a generalized health care state model was developed as the base element, which describes the attributes and properties of an individual health care state. These health care states are then linked to complete a PCMH practice, which consists of twelve health care states and their interactions.

Developing the model in such a manner contributes to ease of model extension. A general prototype for health care state was designed to incorporate all the necessary characteristics, such as capacity, transition probability, and processing time. It can then be easily modified to represent any specific state through minor parameter change. It saves time to build the model, extends its use to different-sized PCMH practice, and maintains the conciseness of the work.

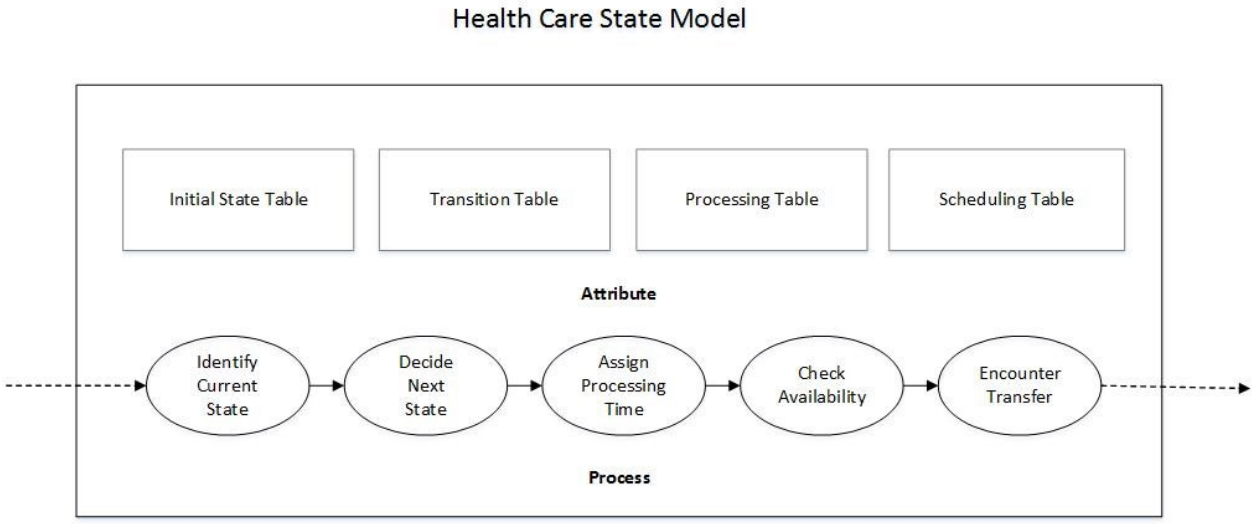

Figure 3: Health Care State Submodel Structure

The health care state model is determined by alternatives from two aspects: attribute and process (see Figure 3). Attribute contains the data information which is used to specify the model. This model imports corresponding transition probabilities (P_{ij} in Appendix C), patient visit encounter transition time (T_{ij} in Appendix D), health care state number (Table 2), and initial encounters distributions (π_i, steady state probability) from matrix tables.

Transit Table | Processing Table | Relation Table | Initial Distribution

	To State	Other	Primary Care	Specialty Care	Urgent Care	Hospital	Emergency Dept	Institutional Stay	Radiology	Lab	Email	Telephone	Pharmacy
▸ 1	Other	31.83	2.909	1.287	0.586	4.596	1.416	3.178	2.45	2.304	2.656	1.18	1.532
2	PrimaryCare	11.47	31.27	11.74	9.07	8.063	14.31	9.396	33.39	21.38	23.23	11.72	16.09
3	SpecialtyCare	12.21	7.403	30.39	3.713	32.69	5.088	8.246	8.209	10.73	0.394	5.167	0.2
4	UrgentCare	0.385	0.951	1.019	9.207	2.37	0.283	0.159	0.515	0.632	2.687	0.292	0.24
5	Hospital	0.278	1.038	0.198	0.135	1.518	1.474	0.366	1.149	0.586	0.462	0.152	0.199
6	EmergencyDept	1.27	0.898	1.604	3.542	24.79	45.38	0.818	0.518	0.419	1.802	0.208	0.152
7	InstitutionalStay	0.766	0.833	0.955	0.131	4.839	1.41	41.24	0.826	1.115	0.717	0.498	0.283
8	Radiology	5.864	3.709	1.519	1.846	0.519	6.017	1.389	14.51	4.897	1.482	1.04	1.215
9	Lab	8.466	11.29	11.34	15.79	0.652	6.782	8.495	5.003	18.33	11.87	8.401	7.164
10	Telephone	4.076	2.635	0.226	0.667	7.481	0.411	2.112	5.644	6.288	17.54	0.998	4.972
11	Pharmacy	23.39	37.06	39.72	55.31	12.48	17.43	24.6	27.78	33.32	37.16	70.34	65.16

Figure 4: Example of Transition Probability Table in the Simulation Model

In Figure 3, "Process" describes the interaction between the health care state and a patient visit encounter when the encounter occurs at that state. It will proceed through the following five steps:

1. Identify current state: A patient visit encounter enters a new health care state. It identifies the current state *i* and looks up health care state number from the initial state table. The patient encounter carries an attribute "Current_State" to record this health state number and the attribute will be updated in this step.
2. Decide next state: The next health care state is based on the transition probability, as shown in Figure 4. The current health care state number corresponds to the column in the transit table reversed from the tables in Appendix C. And the attribute "Next_State" of the encounter will record the row number of the entry which represents the case of this encounter.
3. Assign processing time: After current state *i* and next state *j* are identified, the transition time, also the processing time of the health care state server, T_{ij} is

determined by sampling from the Gamma distribution with shape parameter α and rate parameter β.

4. Check availability: Physician-related health care states, such as primary care and specialty care, have limited capacities. If the capacity of a health care state is fully occupied, the patient visit encounter needs to wait until the next available slot. Scheduling table is used for health care state capacity reference.
5. Transfer encounter to the next state: The patient visit encounter then departs current health care state to its next health care state.

4. Impact of Email Communication

The results of this thesis are given in this chapter to reveal the impact of email communication on patient visit encounters in the PCMH practice at Group Health. Three metrics are shown: number of patient visit encounters per member per month; steady state probability for each of the twelve health care states; and visit frequency for each of the twelve health states. The comparison of the three metrics before and after email implementation is detailed for the nine categories (three age groups and three chronic condition groups).

4.1 Number of Patient Visit Encounters per Member per Month

During the two time periods, the number of patients enrolled at Group Health Cooperative increased by 48%, from 0.537 million to 0.796 million (see Figure A.2). Also, the total number of patient encounters increased 69%, from 36.85 million to 62.43 million (see Figure A.3). So a scale is needed to make a valid comparison between the two time periods. As discussed in Chapter 3, the number of patient visit encounters per member per month equals the number of patient health state visit encounters divided by the number of enrolled member-months. As illustrated in Figure 5, the number of patient visit encounters per member per month to all of the twelve health care states after email implementation is 2.05 as compared to 2.14 before introducing email.

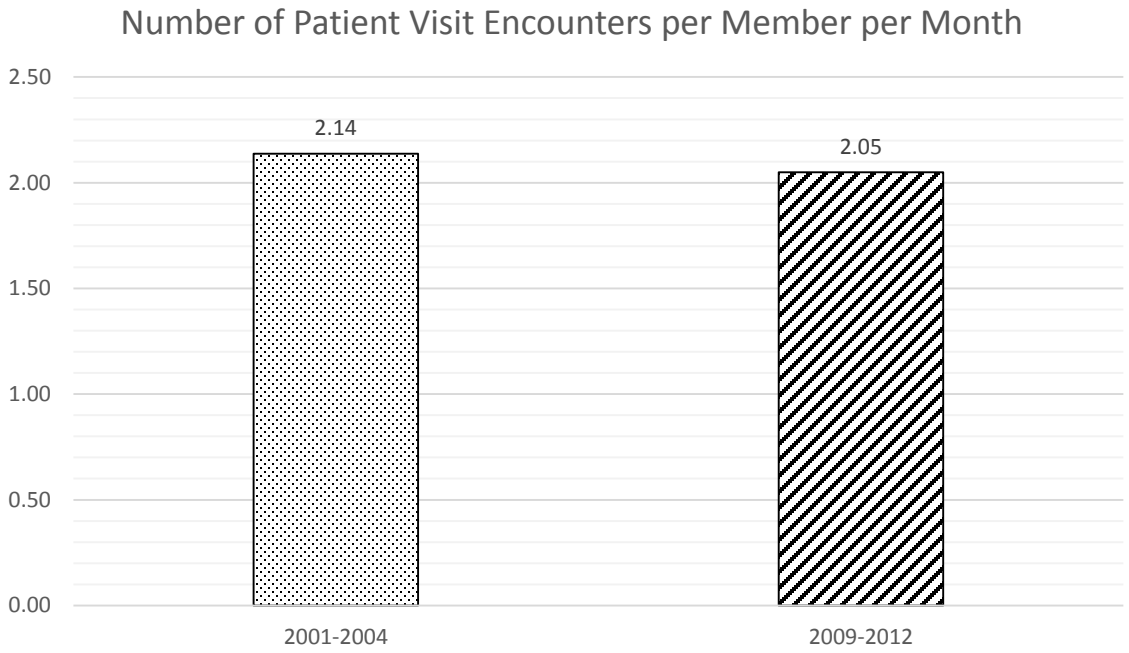

Figure 5: Number of Patient Visit Encounters per Member per Month in Before and After Email Communication Implementation Periods

When taking age into consideration, a more detailed insight can be reached (see Figure 6). The decrease in the number of total patient visit encounters after email implementation from Figure 5 is primarily accounted for by patients in age group 40-64. The number of patient visit encounters per member per month in the age group 40-64 slightly decreased by 6.5%, while in age groups 18 to 39 and 65 and up it increased slightly less than 1% after email participation. The data supports a trend that the number of patient visit encounters per member per month increases as members' age increases. For members aged over 65, their average number of visits per member per month is almost twice that in the 40-64 age group.

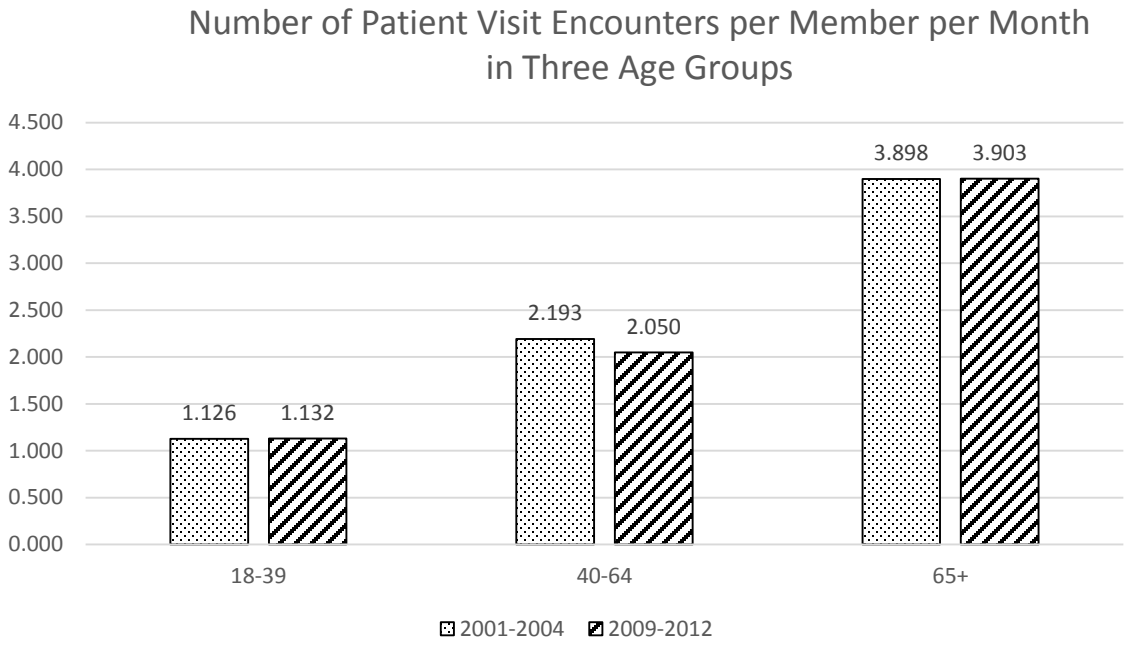

Figure 6: Number of Patient Visit Encounters per Member per Month in Three Age Groups

If grouped by chronic condition, the data shows that the more severe chronic condition the patient is in, the greater number of patient visit encounters per member per month he/she has (see Figure 7). In the period of 2001 to 2004, the number of patient visit encounters per member per month is 1.30 in the group of chronic condition 0, whereas in the group of chronic condition 1, the value increases by more than 100% to 2.61, and increases significantly to 4.62 in the group of chronic condition 2. In the period of 2009 to 2012, the same trend appears, with increased visits per member per months as chronic condition becomes severe. With the participation of email communication, the number of encounters per member per month increased slightly for patients in chronic conditions 0 and 1; the number of patient visit encounters in chronic condition group 0 increased by 11.54%, from 1.30 to 1.45, and increased

by 7.63% in the group of chronic condition 1. The number of encounters per member per month decreased after email implementation for patients in chronic condition 2, by 1.52%, from 4.62 to 4.55.

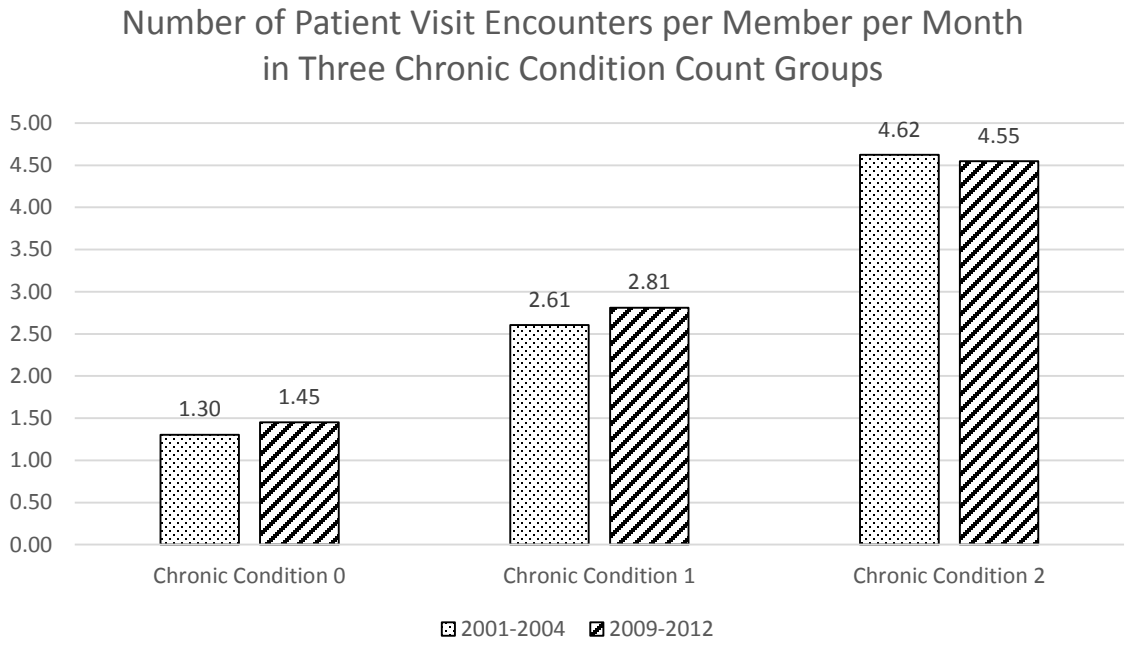

Figure 7: Number of Patient Visit Encounters per Member per Month in Three Chronic Condition Groups

The detailed data by both factors of age and chronic condition shows the trend that the number of patient visit encounters per member per month increases with age and severity of chronic condition (see Figure 8). Comparing before and after email implementation, the age group 40-64 with chronic condition 2 accounts for most of the decrease in patient visit encounters per member per month.

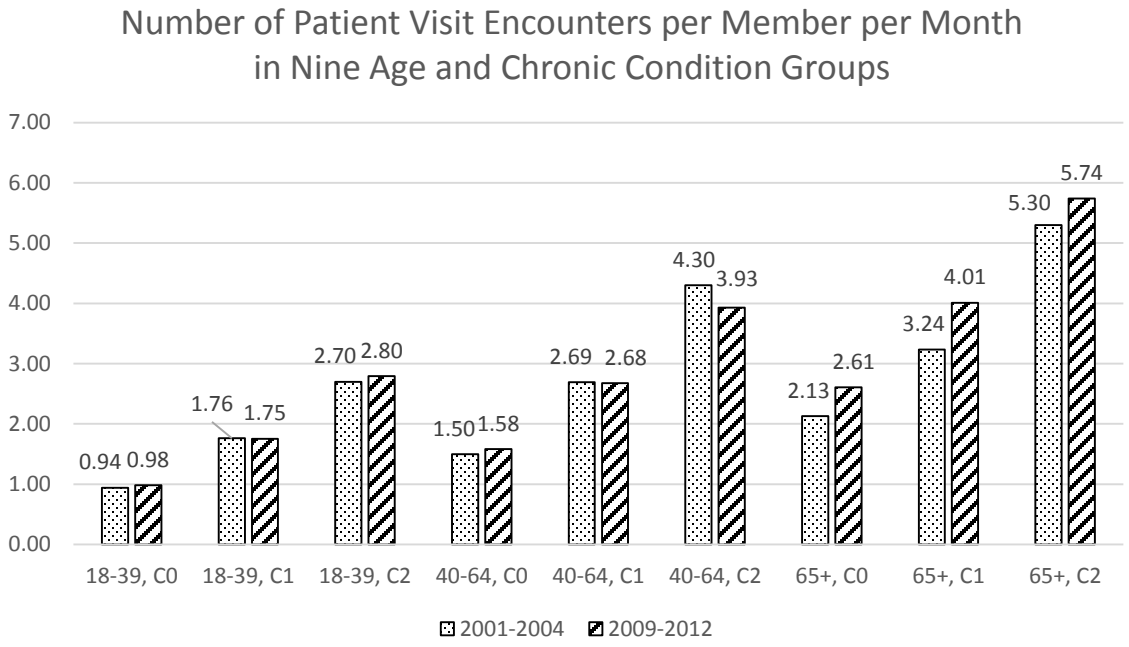

Figure 8: Number of Patient Visit Encounters per Member per Month in Nine Age and Chronic Condition Groups

4.2 Steady State Probabilities of Patient Visit Encounters

As discussed in Chapter 3, the Markov chain model provides an estimate of the steady state probability of a patient visit encounter occurring in each of the twelve health care states (π_i, i = 1, 2, …, 12). This provides the proportion of encounters of each type in the long-run.

Figure 9 illustrates the steady state probabilities of patient visit encounters in the enrollee group of age 18 to 39 and chronic condition count 0. It gives the percentage of patient visit encounters in each health care state i in the long-run. For example, in the time period of 2001-2004, 28.7% of total patient visit encounters are in the health care state of primary care in steady state, whereas in the time period of 2009-2012, 12.3% of the patient visit encounters are in

primary care. The proportion of email in period of 2001 to 2004 is zero because it has not been incorporated into Group Health at that time. In the period of 2009 to 2012, it increases to 6.4%.

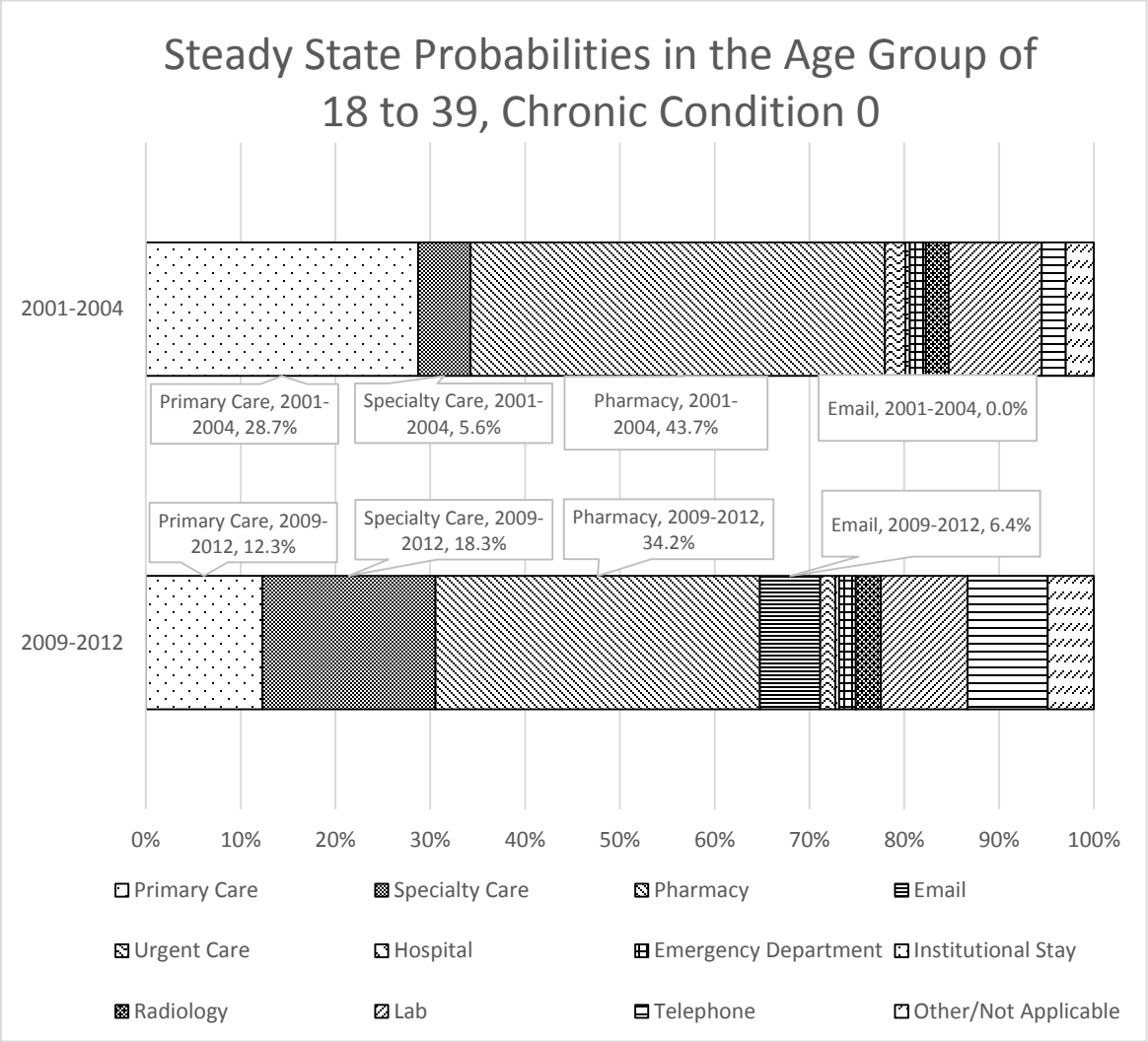

Figure 9: Steady State Probabilities of Patient Visit Encounters in the Group of Age 18 to 39, Chronic Condition Count 0

Steady state probabilities of patient visit encounters in other age and chronic condition groups are shown in Figures 10–17, which all demonstrate the same trend that the proportion of

primary care visits decrease and the proportion of specialty care visits increase in the 2009-2012 time period with email communication.

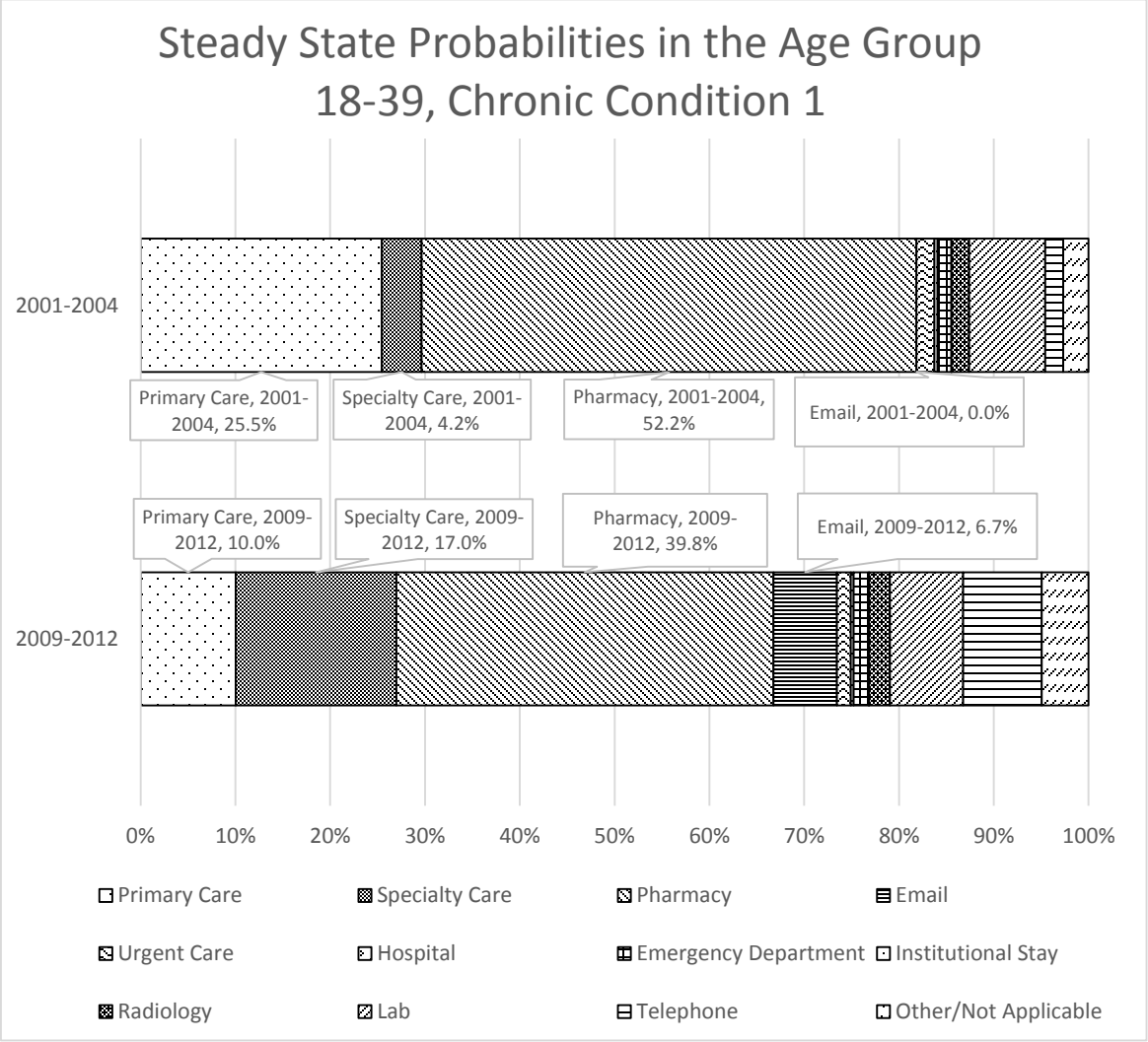

Figure 10: Steady State Probabilities of Patient Visit Encounters in the Group of Age 18 to 39, Chronic Condition Count 1

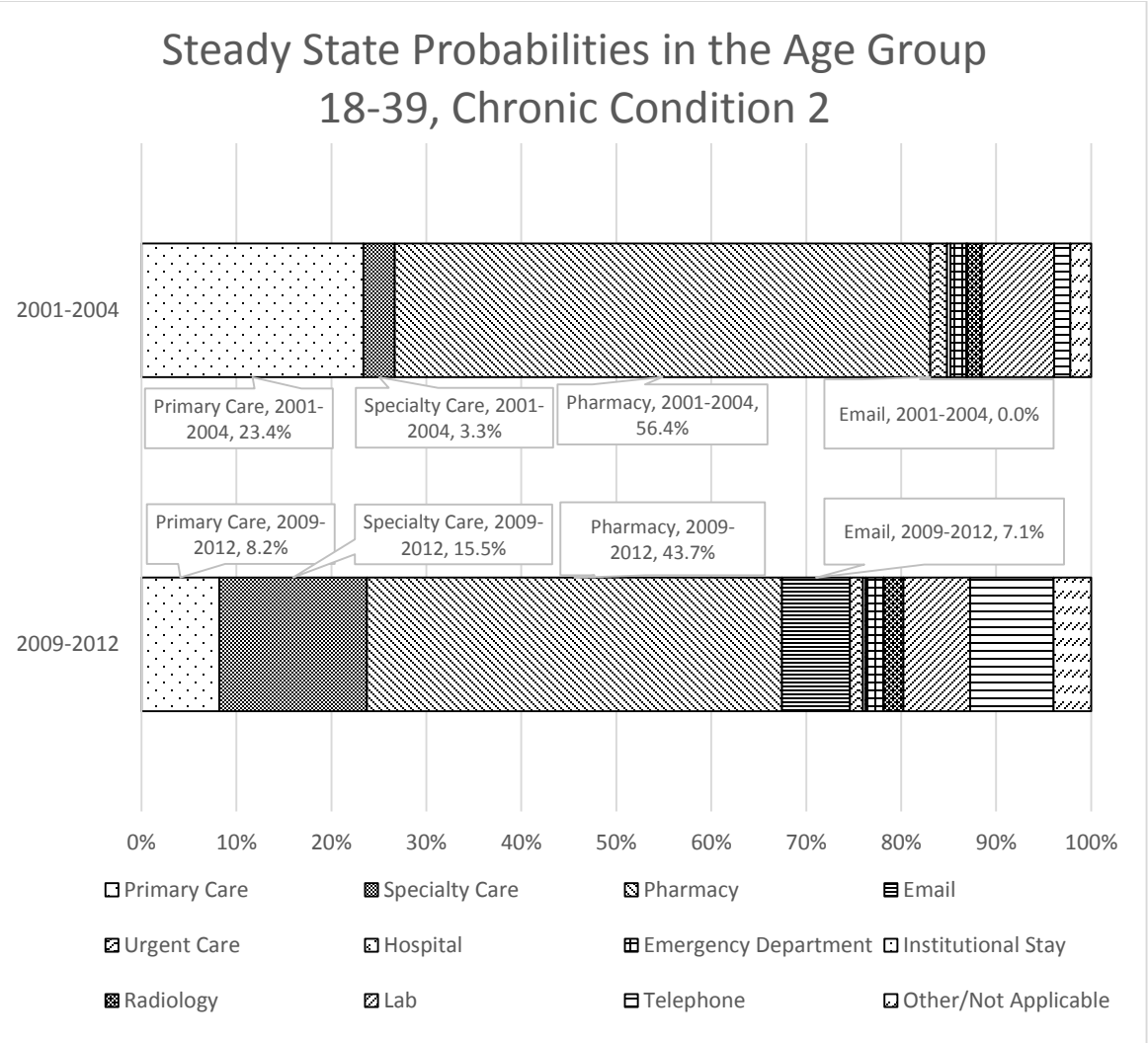

Figure 11: Steady State Probabilities of Patient Visit Encounters in the Group of Age 18 to 39, Chronic Condition Count 2

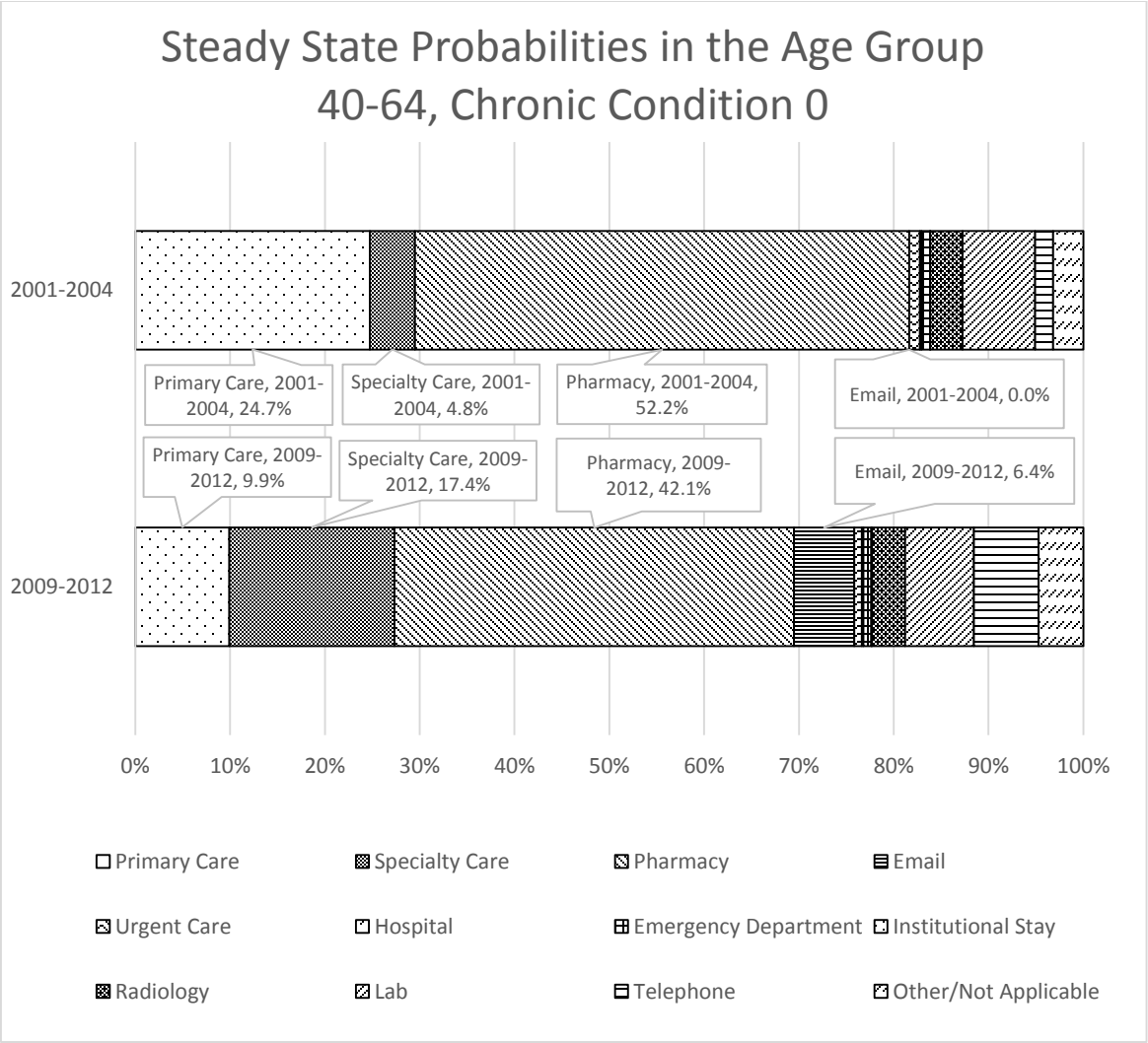

Figure 12: Steady State Probabilities of Patient Visit Encounters in the Group of Age 40 to 64, Chronic Condition Count 0

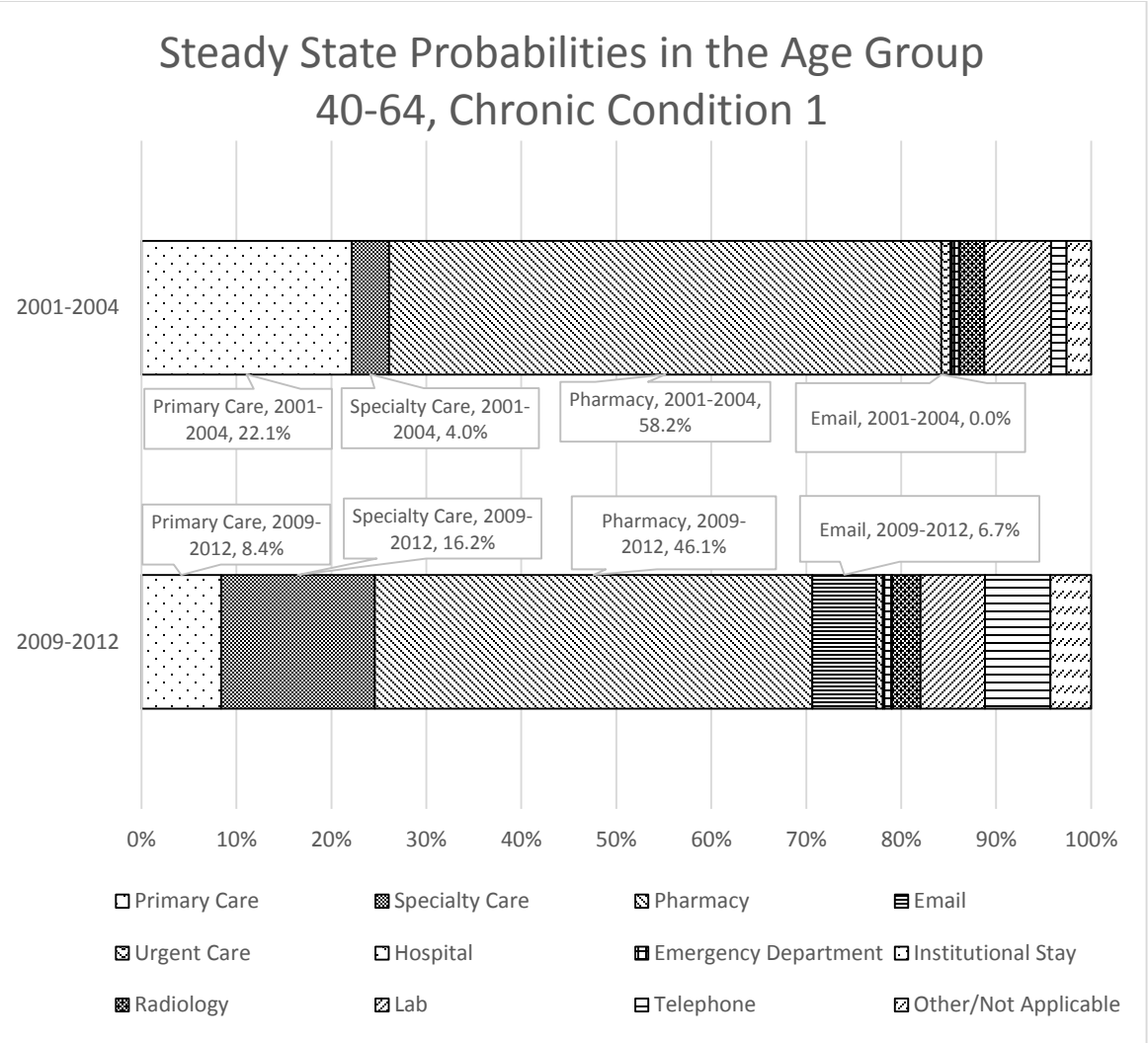

Figure 13: Steady State Probabilities of Patient Visit Encounters in the Group of Age 40 to 64, Chronic Condition Count 1

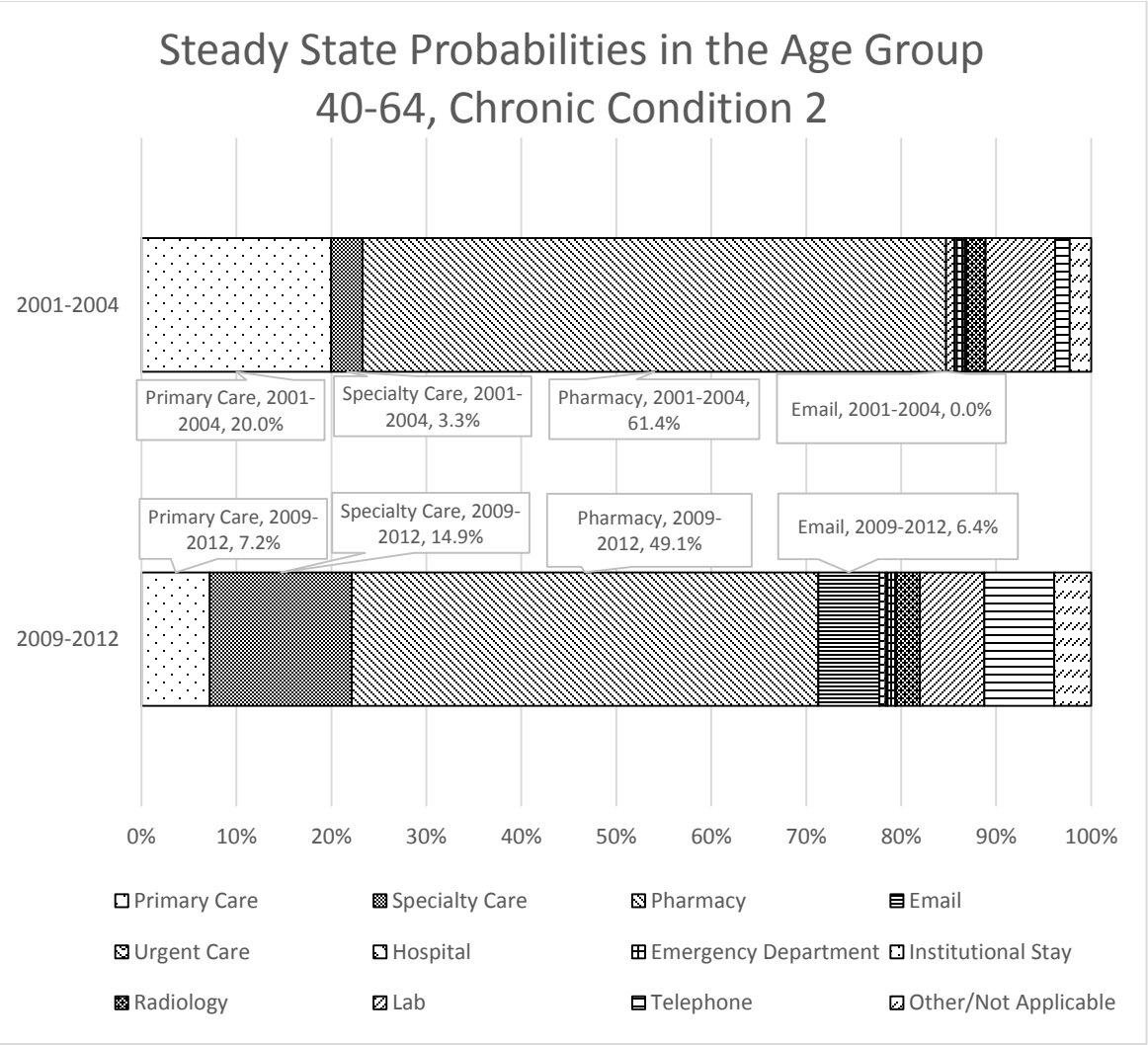

Figure 14: Steady State Probabilities of Patient Visit Encounters in the Group of Age 40 to 64, Chronic Condition Count 2

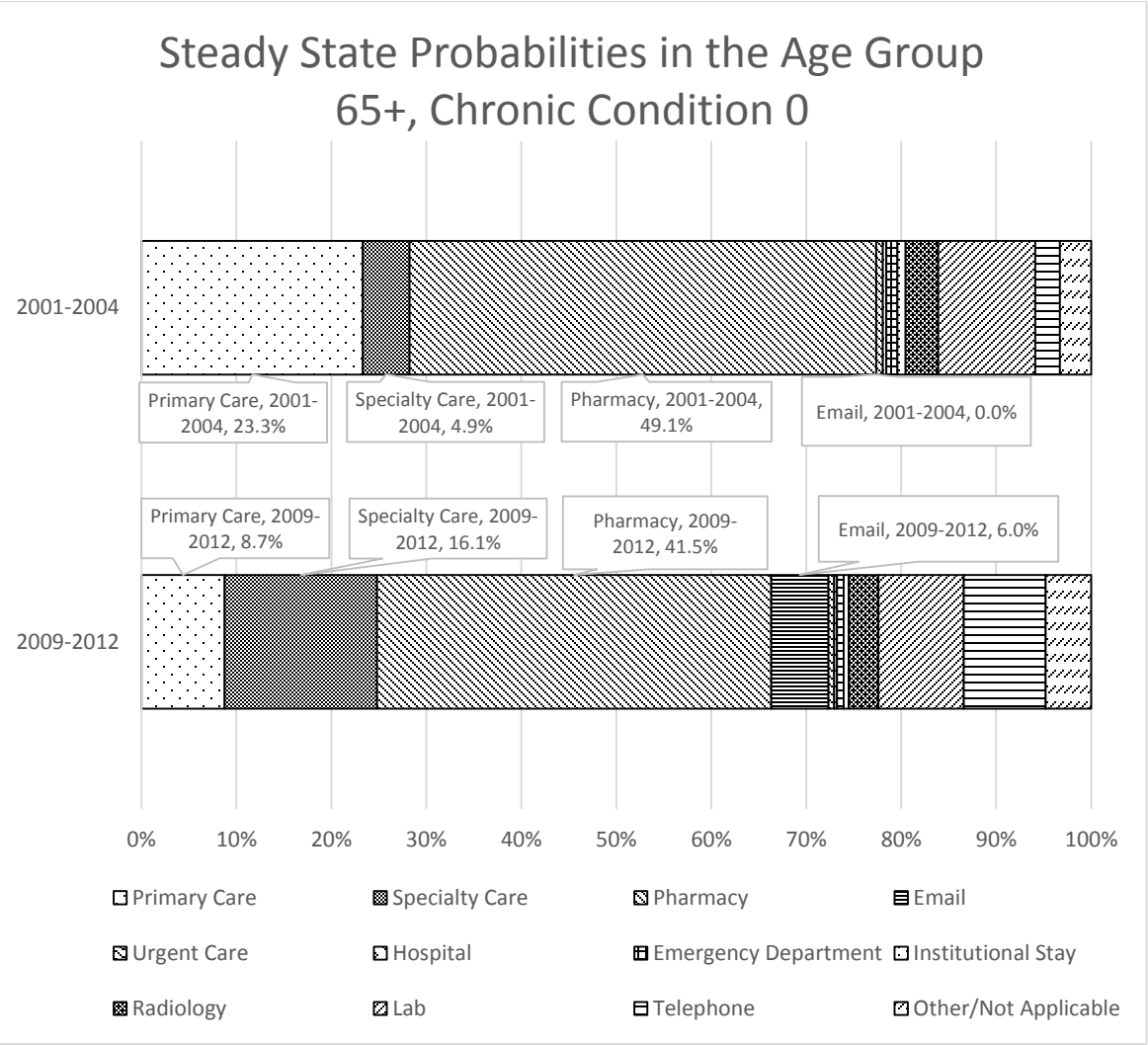

Figure 15: Steady State Probabilities of Patient Visit Encounters in the Group of Age 65+, Chronic Condition Count 0

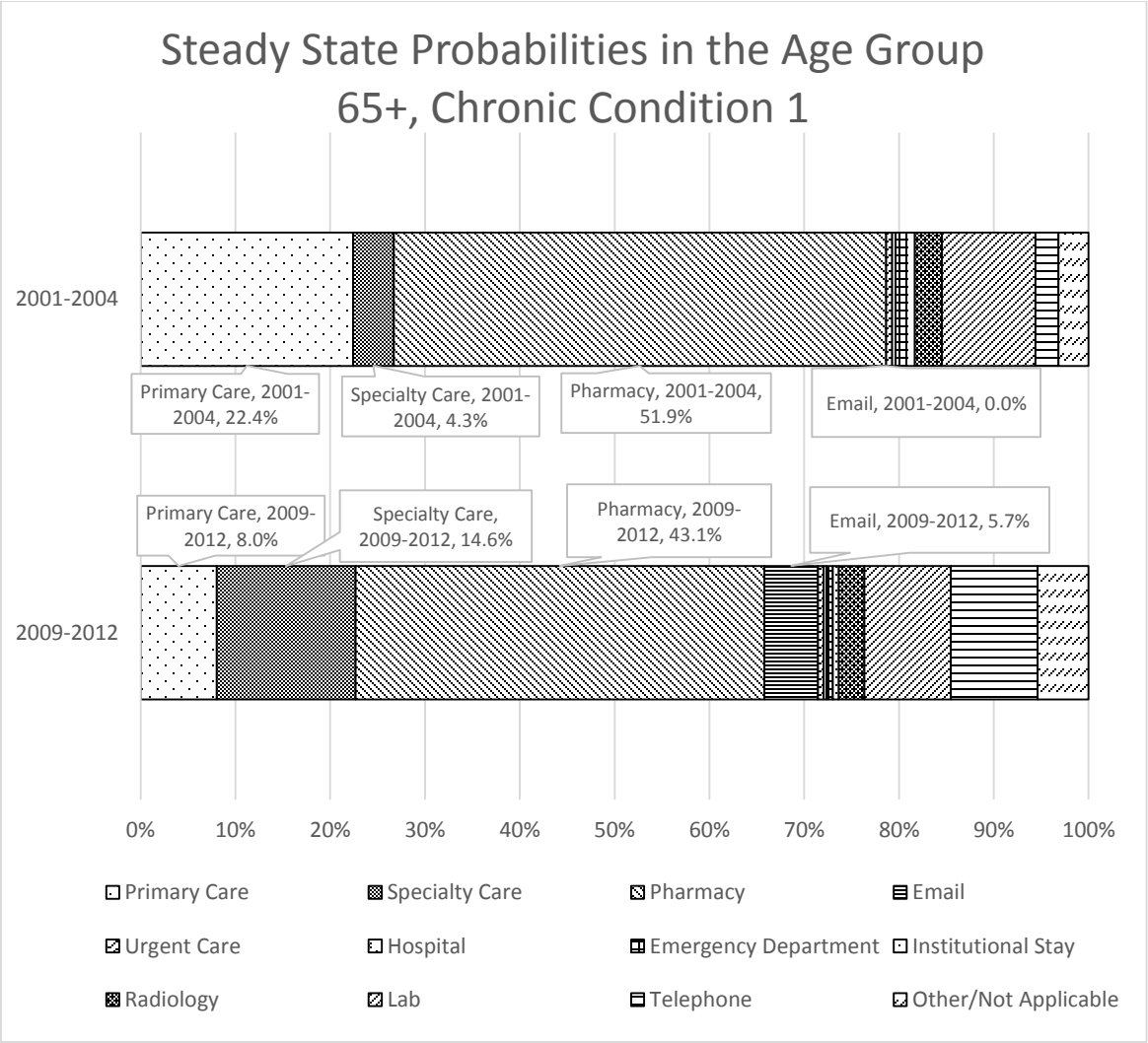

Figure 16: Steady State Probabilities of Patient Visit Encounters in the Group of Age 65+, Chronic Condition Count 1

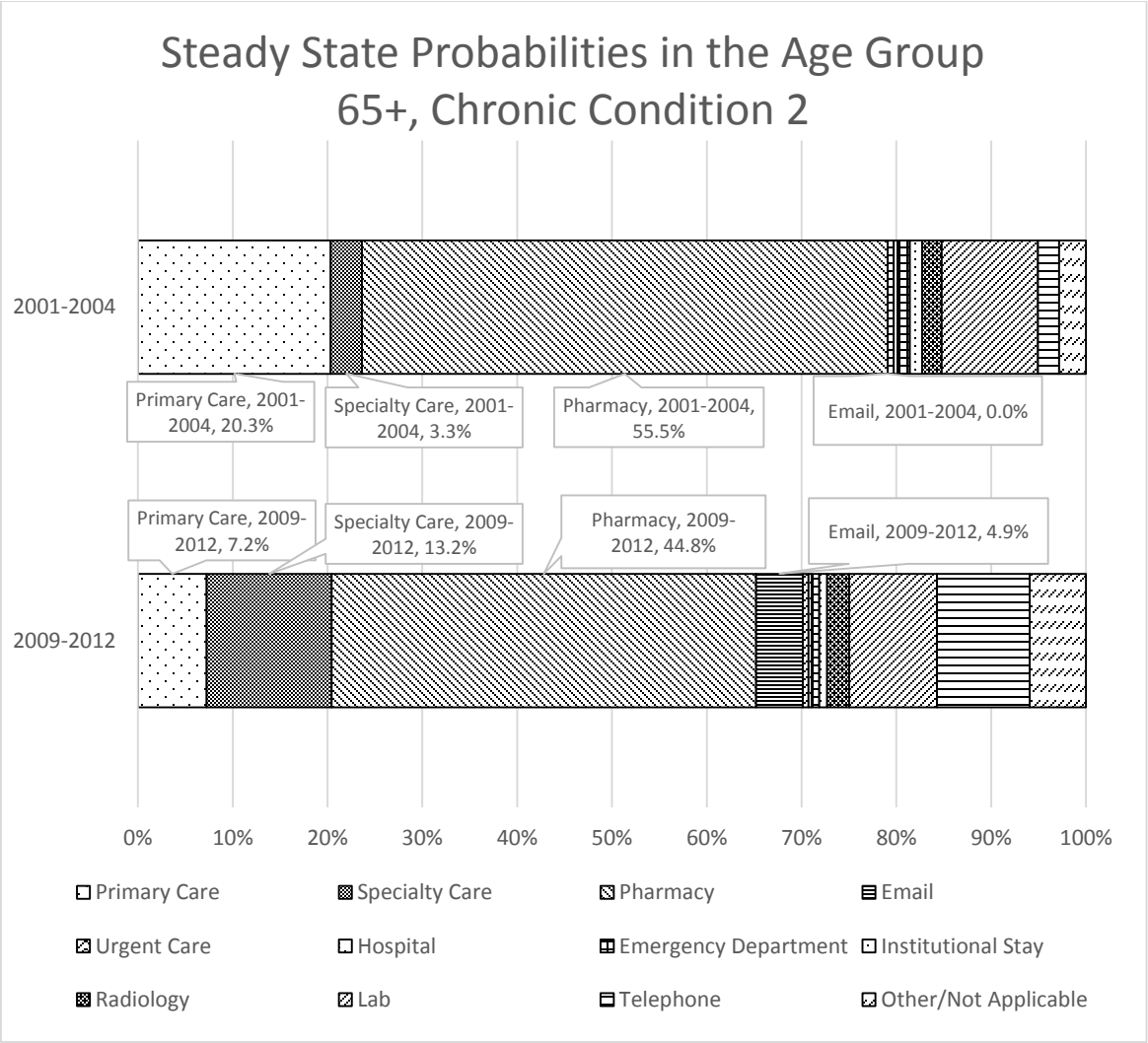

Figure 17: Steady State Probabilities of Patient Visit Encounters in the Group of Age 65+, Chronic Condition Count 2

4.3 Patient Visit Frequency

It is shown that the total number of encounters per member per month decrease with email implementation (Figure 5) in Section 4.1. Section 4.2 illustrates the steady state probability of each type of encounter before and after email implementation. In Section 4.3, we combine encounter per member per month with π_i steady state probability to get a more direct comparison of the impact of email communication.

Face-to-face physician office visits are the focus of this study. It can be represented as the combination of primary care visits and specialty care visits. With email implementation, face-to-face primary and specialty care combined visit frequency for all nine patient categories decreases from 0.58 to 0.52 (see Figure 18).

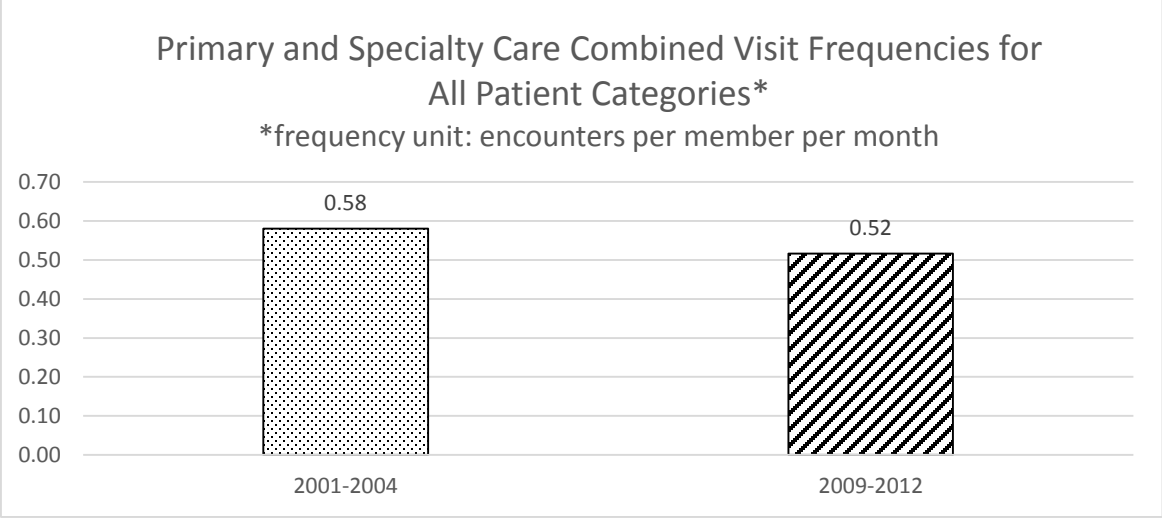

Figure 18: Primary and Specialty Care Combined Visit Frequencies for All Patient Types

The results are consistent when patient types are categorized by age factor (see Figure 19). When taking age into consideration, the primary and specialty combination visit frequency

drops from 0.37 to 0.33 in age group of 18-39, from 0.58 to 0.52 in age group of 40-64, and from 0.97 to 0.87 in the age group of 65 and up, after email implementation.

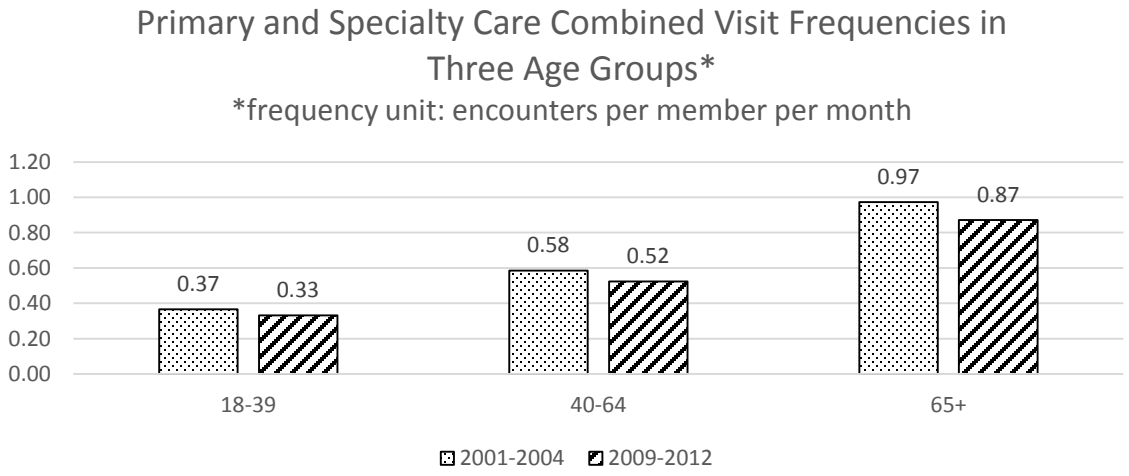

Figure 19: Primary and Specialty Care Combined Visit Frequencies in Three Age Groups

When taking chronic condition into consideration, physician visit frequency decreases in two of three chronic condition groups (see Figure 20). It remains the same at 0.40 in chronic condition 0 and decreases from 0.70 to 0.68 in chronic condition 1 and from 1.09 to 0.97 in chronic condition 2, after email implementation.

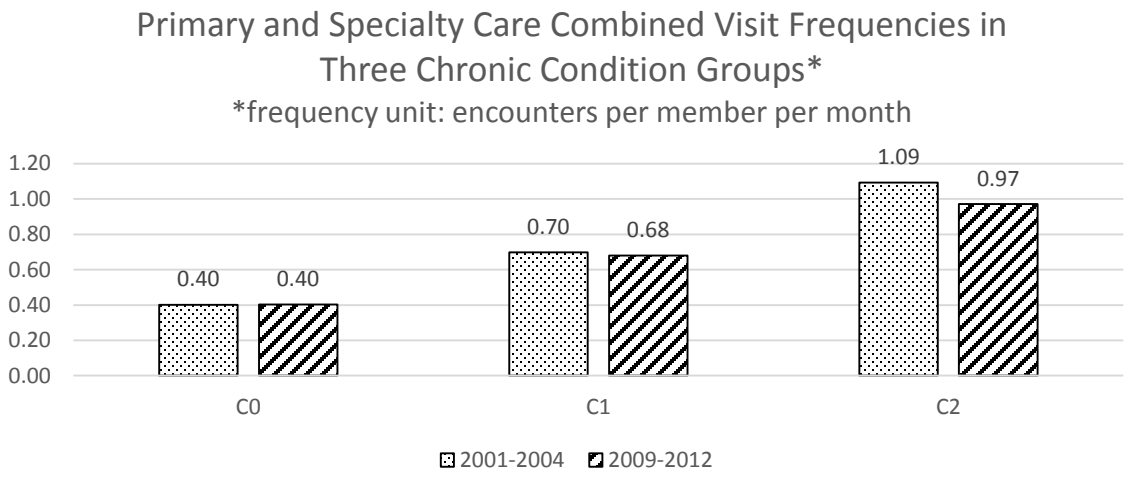

Figure 20: Primary and Specialty Care Combined Visit Frequencies in Three Chronic Condition Groups

Figure 21 illustrates the primary and specialty care visit frequency in all nine detailed age and chronic condition groups. The decrease of face-to-face physician visits is consistent in most groups, with two exceptions, face-to-face physician visit frequency increases from 0.60 to 0.65 in the group of 65 and up, chronic condition 0 and slightly up from 0.86 to 0.91 in group of 65 and up, chronic condition 1.

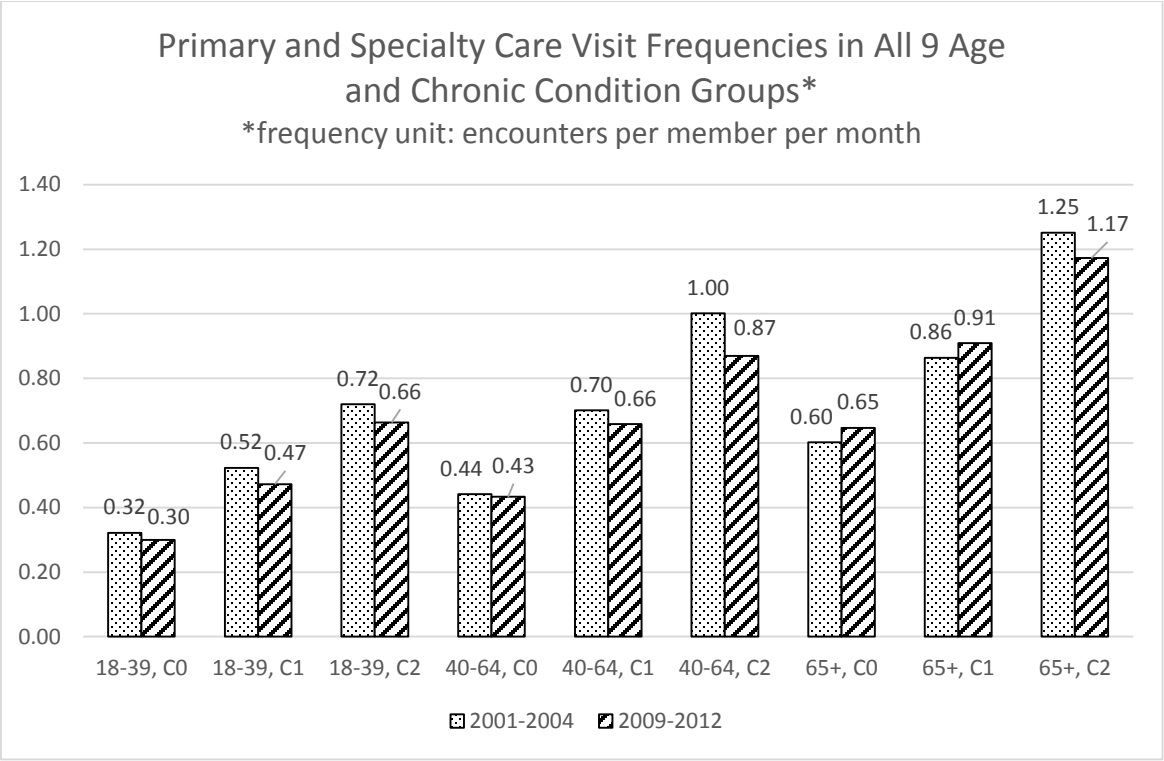

Figure 21: Primary and Specialty Care Visit Frequencies in All Nine Age and Chronic Condition Groups

Primary care visit frequency decreases in all nine detailed age and chronic condition groups (see Table 3). It is cut over half, dropping from monthly primary care visit range of 0.269 to 1.078 in the time period of 2001-2004, to a range of 0.121 to 0.416 in the period 2009-2012. Also, the older the patient is, the higher their primary care visit frequency.

Table 3: Visit Frequency of Patient Visit Encounters to Primary Care

Age Group	Chronic Condition 0			Chronic Condition 1			Chronic Condition 2		
	2001-2004	2009-2012	Trend	2001-2004	2009-2012	Trend	2001-2004	2009-2012	Trend
18-39	0.269	0.121	↓	0.449	0.176	↓	0.631	0.229	↓
40-64	0.370	0.157	↓	0.595	0.225	↓	0.860	0.283	↓
65+	0.497	0.228	↓	0.726	0.332	↓	1.078	0.416	↓

Specialty care visit frequency increases by at least 200% after introducing email (see Table 4). Its range jumps from previous 0.052 to 0.173 in period of 2001-2004 to a range of 0.179 to 0.757 in 2009-2012.

Table 4: Visit Frequency of Patient Visit Encounters to Specialty Care

Age Group	Chronic Condition 0			Chronic Condition 1			Chronic Condition 2		
	2001-2004	2009-2012	Trend	2001-2004	2009-2012	Trend	2001-2004	2009-2012	Trend
18-39	0.052	0.179	↑	0.074	0.297	↑	0.089	0.434	↑
40-64	0.071	0.276	↑	0.106	0.433	↑	0.141	0.587	↑
65+	0.105	0.419	↑	0.138	0.587	↑	0.173	0.757	↑

Physician self-referral is one of the possible reasons to explain the increase in specialty care visit frequency. In 2009-2012, patients were allowed to schedule consultations with specialists without referral from primary care physicians, which can result in this increase in

patient specialty care visits. A possible cause for the decrease in primary care is that primary care visits are more easily substituted with email than specialty care visits. Primary care physicians provide preliminary diagnoses and follow-up care which can be less dependent on face-to-face communication and inspection. That led to the result that primary care visits substituted by virtual medicine.

Detailed visit frequencies for all nine groups are shown in Appendix E. To illustrate, Figure E.1 shows the visit frequency result in age group 18 to 39 with chronic condition 0. Visit frequency of primary care is 0.269 in the period of 2001 to 2004. That means that an enrollee makes 0.269 primary care visits per month before email implementation, while after email implementation, the value drops to 0.121. In the meantime, visit frequency of specialty care increases from 0.052 to 0.179.

5. Simulation Modeling Research

This study provides a generic simulation model for a PCMH health care delivery system. It offers numerical validation for the Markov chain model and patient scheduling capability.

5.1 Model Description

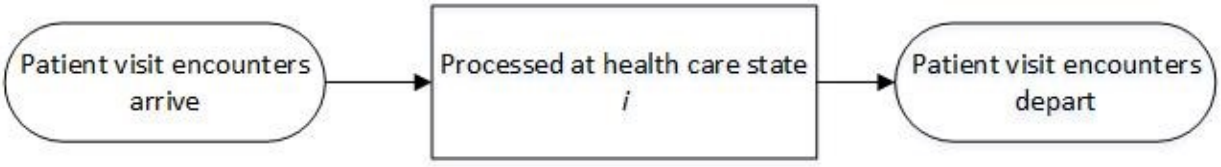

Figure 22: Conceptual Model for the PCMH

Patient visit encounter are set as entities entering the model, while health care states are set as servers (see Figure 22). "A patient visit encounter in state *i*" is described as the encounter being served at server of health state *i.* After being processed at current health state, the encounter departs and move to the next health care state.

There are a total of 1000 patient visit encounters initially distributed in the model. They are divided into different health states based on the steady state probability π_i, for i = 1, 2, …, 12. These encounters then proceed to the step of identifying current state. In this step, the patient visit encounter looks up the health care state number ("State_Index" in Figure 23, also see Table 2) based on its current node position ("Transfer Node" in Figure 23).

	State_Index	State_Name	Transfer Node
▸ 1	1	Other	Input_Server1@Other
2	2	PrimaryCare	Input_Server1@PrimaryCare
3	3	SpecialtyCare	Input_Server1@SpecialtyCare
4	4	UrgentCare	Input_Server1@UrgentCare
5	5	Hospital	Input_Server1@Hospital
6	6	EmergencyDept	Input_Server1@EmergencyDept
7	7	InstitutionalStay	Input_Server1@InstitutionalStay
8	8	Radiology	Input_Server1@Radiology
9	9	Lab	Input_Server1@Lab
10	10	Telephone	Input_Server1@Telephone
11	11	Pharmacy	Input_Server1@Pharmacy

Figure 23: Model Relation Table

The patient visit encounter then comes to the process of deciding next state j, for j = 1, 2, …, 12, and assigning processing time T_{ij}, for i = 1, 2, …, 12 and j = 1, 2, …, 12. Transition probability tables of P_{ij} (reversed from the tables in Appendix C) and processing time tables of T_{ij} (reversed from the tables in Appendix D) are utilized to import the data. The transition probability tables are mapped reversely from Excel sheet to Simio because Simio has a different function logic from the data collection method used in the data sheet.

The checking availability step inspects the match condition between patient appointment demand and health care state availability (see Figure 24). A_t represents the available appointment spot at time t and R_t represents the patient reservation request at time t. The reservation is validated if $R_t \leq A_t$, otherwise the reservation will be postponed to the next available spot. For example, after visiting primary care state, the patient is diagnosed to receive specialty care. However, the appointment request is rejected because the specialty care state

does not have an available appointment at the time requested ($R_t > A_t$). Then a visit delay occurs, to arrange the patient visit encounter to the nearest available date. By accumulating visit encounters' delay, the functionality of estimating the patient visit encounter's waiting time for a health care state is achieved.

Table 4: Steady State Probability Validation for the Group of Age 18 to 39, Chronic Condition 0, 2001 to 2004

	π_i from Markov chain	Number of Patient Visit Encounters	π_i from simulation
Other/Not Applicable	3.0%	27	2.70%
Primary Care	28.7%	296	29.60%
Specialty Care	5.6%	52	5.20%
Urgent Care	2.2%	20	2.00%
Hospital	0.5%	4	0.40%
Emergency Department	1.7%	16	1.60%
Institutional Stay	0.0%	0	0.00%
Radiology	2.4%	22	2.20%
Lab	9.8%	99	9.90%
Email	0.0%	0	0.00%
Telephone	2.5%	23	2.30%
Pharmacy	43.7%	441	44.10%
SUM	100.0%	1000	100.00%

The model validates the steady state probability by checking the number of entities at each health care state at the end of simulation. Steady state probability in health state i is denoted as π_i and can be obtained as the proportion of number of entities in that health care state. Table 4 compares π_i from the Markov chain calculation and π_i from the simulation model. The result is verified by paired t-test, with a significance level of 0.05, revealing there is no statistically significant difference between two result groups.

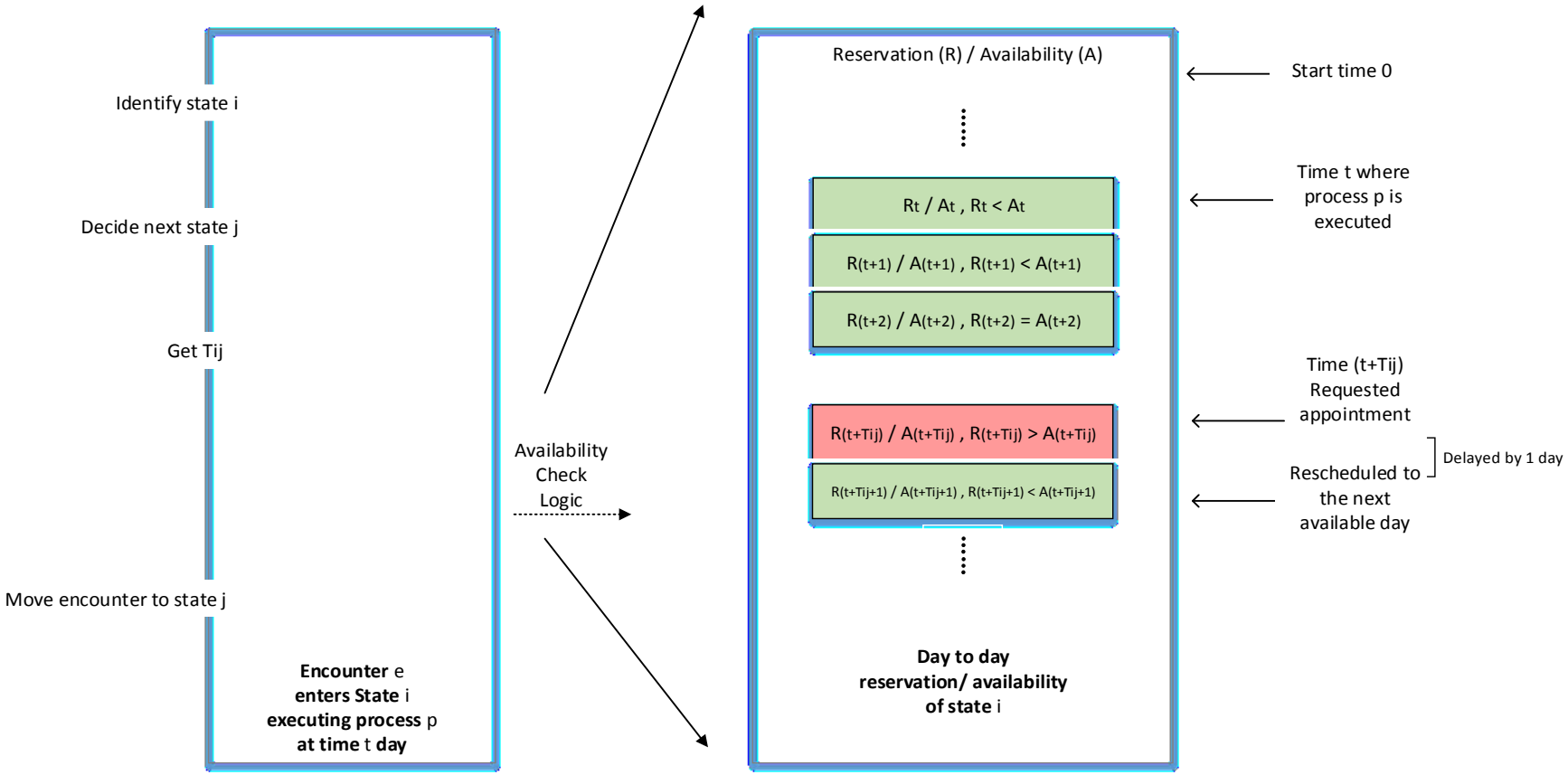

Figure 24: Rescheduling Process

6. Conclusion

The following chapter summarizes the results of this thesis. Limitations are given to clarify the scope and boundary of the study. Future research recommendations are discussed to provide ideas which arose during this thesis in order to help further explore the topic of virtual medicine.

6.1 Summary

This thesis investigates the impact of email communication on patient encounters. The data analysis shows that the frequency of face-to-face patient visit encounters decreases when email communications available, which supports previous research (Zhou et al., 2007) that concluded virtual medicine helps decrease patients' office visits to physicians. However, when face-to-face physician visits were separated into primary care visits and specialty care visits, the impact of email was different. After email implementation, patient primary care visit frequency decreased and specialty care visit frequency increased. These results were consistent in all nine age and chronic condition groups. Primary care visit frequency is cut by over half, dropping from the range of 0.269-1.078 in the period of 2001-2004, to the range of 0.121-0.416 in the period 2009-2012, whereas specialty care visit frequency increases from previous visit frequency range of 0.052-0.173 to the latter range of 0.179-0.757. The dramatic increase in specialty care may be explained by a change in policy regarding self-referral in 2009-2012. Self-referral allows patients to refer themselves to a specialist without having to see a primary care physician first. A possible explanation for the decrease in primary care is that email communication can

substitute for primary care visits more easily than it can for specialty care, because email communication can help with follow-up care while diagnoses of complex and severe symptoms still largely rely on the face-to-face specialty physician judgment.

A generalized discrete-event health care simulation model was developed. It was constructed following extendable and reusable principles in order to be applicable to different-sized health care systems. The simulation model is featured with capabilities of simulating patient visit encounter transitions, obtaining steady state probabilities, and rescheduling patient visit reservations. It was developed as a validation tool for patient visit encounters analysis base on the Markov chain model in this thesis. Moreover, it captures the information of health care state capacity which is used to model physician appointment process and estimate patient wait time.

6.2 Limitation

In the simulation model, T_{ij}, the patient visit encounter processing time is used to calculate patient visit delay time. However, the item "Mean no. of days" in the datasets which recorded patient staying time in a certain health care state, has already counted the patient wait time. As a consequence, the simulation delay results with the current dataset cannot accurately separate wait time for an appointment from the natural time between visit encounters.

6.3 Recommendation for Future Research

This thesis makes a start on exploring the impact of virtual medicine on PCMH practice. One direction for future work is to continue the study with specialist self-referral taken into

account. Based on this thesis, the impact of email communication supports the study result at Kaiser Permanente Northwest that virtual medicine helps reduce patient face-to-face physician visits. However, there is insufficient evidence to confirm the improvement which virtual medicine brings to health care system. The burgeoning of specialist self-referral mechanism needs to be considered. For example, self-referrals' to magnetic resonance imaging (MRI) and computed tomography (CT) services are increasing faster than that of non-self-referrals (United States Government Accountability Office, 2012). In this study, the number of MRI services, in particular, increased over 80% for self-referrers to only a 12% increase for non-self-referred services.

Another avenue for future research is to study the influence of different incentives on a PCMH. In many PCMH practices, primary care physicians are not rewarded for virtual medicine treatment, especially on sending secured messages and email communications. A study of copayment mechanisms with virtual medicine participation might be explored. It is of great interest to evaluate how alternative policies promote those incentives. By designing unified medical convention effectiveness, cost, and physician workload parameters, it is feasible to experiment with different compensation strategies using the simulation model.

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Appendix A

Table A.1: Number of Enrollees and Member-Month for 18 Categories

Time Period	Age	Chronic Condition	Gender	No. of Enrollees	Avg. Months Enrolled	Std. Deviation of Months Enrolled	# of Member * Avg. Month Enrolled
2001-2004	18-39	0	F	99,970.00	27.6713	17.8788	2,766,300
2001-2004	18-39	0	M	73,318.00	28.8431	17.7795	2,114,718
2001-2004	18-39	0	Total	173,288.00			4,881,018
2009-2012	18-39	0	F	147,868.00	34.3557	13.7196	5,080,109
2009-2012	18-39	0	M	110,835.00	34.9068	13.8488	3,868,895
2009-2012	18-39	0	Total	258,703.00			8,949,004
2001-2004	18-39	1	F	14,804.00	29.6629	18.3609	439,130
2001-2004	18-39	1	M	8,324.00	30.588	18.4486	254,615
2001-2004	18-39	1	Total	23,128.00			693,744
2009-2012	18-39	1	F	17,197.00	35.2437	13.9284	606,086
2009-2012	18-39	1	M	11,300.00	35.4823	14.2719	400,950
2009-2012	18-39	1	Total	28,497.00			1,007,036
2001-2004	18-39	2	F	6,181.00	32.0878	17.8173	198,335
2001-2004	18-39	2	M	3,133.00	32.8153	18.2024	102,810
2001-2004	18-39	2	Total	9,314.00			301,145
2009-2012	18-39	2	F	7,670.00	34.5606	14.1639	265,080
2009-2012	18-39	2	M	4,775.00	35.2547	14.3321	168,341
2009-2012	18-39	2	Total	12,445.00			433,421
2001-2004	40-64	0	F	89,615.00	31.1396	19.6553	2,790,575
2001-2004	40-64	0	M	76,541.00	32.2742	19.16	2,470,300
2001-2004	40-64	0	Total	166,156.00			5,260,875
2009-2012	40-64	0	F	149,255.00	39.3287	12.1597	5,870,005
2009-2012	40-64	0	M	121,868.00	39.9294	11.9847	4,866,116
2009-2012	40-64	0	Total	271,123.00			10,736,121
2001-2004	40-64	1	F	27,589.00	33.8876	19.2028	934,925
2001-2004	40-64	1	M	20,323.00	33.9644	19.1999	690,259
2001-2004	40-64	1	Total	47,912.00			1,625,183
2009-2012	40-64	1	F	33,168.00	40.8465	11.6141	1,354,797
2009-2012	40-64	1	M	22,758.00	41.3603	11.4543	941,278
2009-2012	40-64	1	Total	55,926.00			2,296,074

Time Period	Age	Chronic Condition	Gender	No. of Enrollees	Avg. Months Enrolled	Std. Deviation of Months Enrolled	# of Member * Avg. Month Enrolled
2001-2004	40-64	2	F	21,005.00	36.2323	17.826	761,059
2001-2004	40-64	2	M	16,302.00	36.4537	17.6861	594,268
2001-2004	40-64	2	Total	37,307.00			1,355,328
2009-2012	40-64	2	F	27,655.00	39.72	12.3907	1,098,457
2009-2012	40-64	2	M	19,834.00	39.9639	12.4659	792,644
2009-2012	40-64	2	Total	47,489.00			1,891,101
2001-2004	65 +	0	F	13,687.00	38.4844	16.3165	526,736
2001-2004	65 +	0	M	10,367.00	37.9774	16.6498	393,712
2001-2004	65 +	0	Total	24,054.00			920,448
2009-2012	65 +	0	F	30,454.00	42.3597	10.6942	1,290,022
2009-2012	65 +	0	M	26,213.00	41.907	11.0186	1,098,508
2009-2012	65 +	0	Total	56,667.00			2,388,530
2001-2004	65 +	1	F	10,621.00	39.2914	16.1924	417,314
2001-2004	65 +	1	M	7,502.00	38.3472	16.7548	287,681
2001-2004	65 +	1	Total	18,123.00			704,995
2009-2012	65 +	1	F	14,886.00	43.6565	9.6793	649,871
2009-2012	65 +	1	M	11,230.00	43.1718	10.1174	484,819
2009-2012	65 +	1	Total	26,116.00			1,134,690
2001-2004	65 +	2	F	21,177.00	40.1746	14.7458	850,778
2001-2004	65 +	2	M	16,401.00	39.1084	15.3462	641,417
2001-2004	65 +	2	Total	37,578.00			1,492,194
2009-2012	65 +	2	F	21,775.00	41.9968	11.1891	914,480
2009-2012	65 +	2	M	16,925.00	41.7475	11.3247	706,576
2009-2012	65 +	2	Total	38,700.00			1,621,057

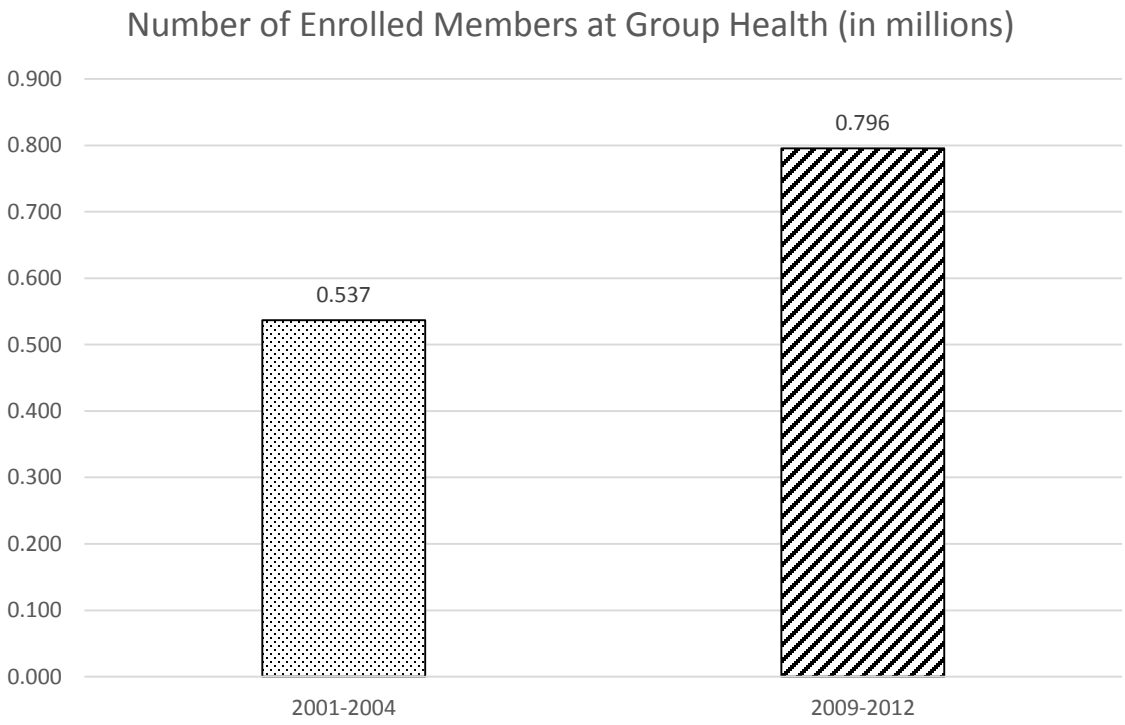

Figure A.2: Number of Enrolled Members in Two Time Periods

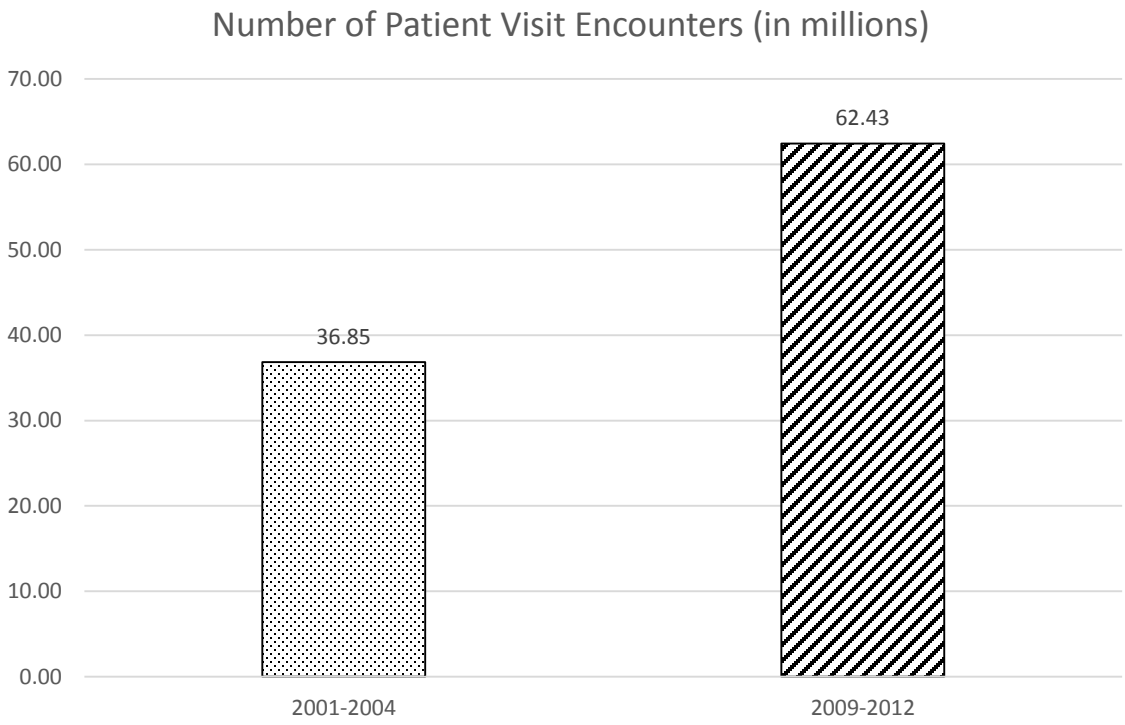

Figure A.3: Number of Patient Visit Encounters in Two Time Periods

Appendix B

Tables in this appendix provide the number of patient visit encounters in twelve health care states. The health care states are Not Application (abbreviated as NA), Primary Care (PC), Specialty Care (SC), Urgent Care (UC), Hospital (Hos), Emergency Department (ED), Institutional Stay (IS), Radiology (R), Email (E), Laboratory (Lab), Telephone (Tel), and Pharmacy (P).

The interpretation of the table can be found in section 3.1.

Table B.1: Number of Patient Visit Encounters in Group 18 to 39, Chronic Condition 0, 2001-2004

	Next State (NS)											
Current State (CS)	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P	All
NA	54428	18337	13084	1573	542	1991	24	8508	8472	4818	24804	136581
PC	32523	548784	**44331**	28522	8414	9650	83	23353	151018	17069	462219	**1325966**
SC	7184	34886	90418	2748	3318	2692	14	10074	31899	11132	61223	255588
UC	393	12085	739	10298	45	3031	3	1699	11855	748	62397	103293
Hos	1293	4286	5066	338	4424	1409	21	64	289	872	3695	21757
ED	548	13649	1200	1119	396	39201	14	3976	2596	628	17948	81275
IS	37	58	32	2	3	14	170	6	25	6	64	417
R	4311	43137	13571	2119	747	1385	14	13095	5532	6834	18599	109344
Lab	9078	180604	27673	12919	1869	4757	40	26411	62334	21112	102521	449318
Tel	4285	25472	10020	8802	464	2642	11	1651	7224	21953	33981	116505
P	22536	435179	48647	31118	1535	12672	103	21323	168065	30704	1209383	1981265
Total	136616	1316477	254781	99558	21757	79444	497	110160	449309	115876	1996834	4581309

Table B.2: Number of Patient Visit Encounters in Group 18 to 39, Chronic Condition 0, 2009-2012

	NS												
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P	All
NA	213382	33205	60407	3876	687	8508	23	5771	11942	13657	17228	58183	426869
PC	25293	241534	145205	9039	2232	9810	66	18390	136688	41863	79554	387095	1096769
SC	42699	126763	708149	14676	11990	16073	114	47560	126480	75930	108379	327735	1606548
UC	744	4775	3278	22827	76	3236	4	2578	16839	4898	5469	78796	143520
Hos	967	2429	4802	295	6685	675	29	38	404	1322	6343	12924	36913
ED	1840	9564	7517	865	1044	67519	16	20993	3346	1763	5445	38578	158490
IS	13	20	141	1	6	9	429	3	10	2	54	141	829
R	10321	36513	53539	3102	2045	4814	25	24633	5666	22368	36471	29188	228685
Lab	22747	100328	119813	10163	4192	5593	44	36825	196421	91678	117407	101389	806600
E	15802	70417	105628	10277	1065	2784	18	12834	32292	108666	53344	142483	555610
Tel	16704	116644	92468	33329	2733	13460	72	14303	44398	67358	149934	191135	742538
P	76279	338713	303324	31453	4170	22878	198	46256	232703	128341	162158	1632662	2979135
Total	426791	1080905	1604271	139903	36925	155359	1038	230184	807189	557846	741786	3000309	8782506

Table B.3: Number of Patient Visit Encounters in Group 18 to 39, Chronic Condition 1, 2001-2004

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P	All
NA	12843	4198	3028	359	110	425	25	1670	1846	1010	6990	32504
PC	7499	123297	8430	6505	1763	2129	48	4809	29255	2746	125562	312043
SC	1660	6167	17059	486	428	471	5	1886	5541	2277	15300	51280
UC	95	2287	125	1992	11	699	1	292	2567	121	15055	23245
Hos	210	762	751	105	607	469	7	8	28	182	880	4009
ED	121	2811	188	242	103	8656	2	730	602	128	4408	17991
IS	67	30	11	0	1	5	55	1	16	4	35	225
R	828	8549	2103	438	136	300	16	2637	954	1270	5245	22476
Lab	1927	36176	4703	2719	303	972	15	5019	12633	3792	29939	98198
Tel	862	4133	1949	1543	83	548	3	314	1441	4398	8069	23343
P	6458	123169	13043	8744	453	3280	59	5228	43344	7470	427377	638625
Total	32570	311579	51390	23133	3998	17954	236	22594	98227	23398	638860	1223939

Table B.4: Number of Patient Visit Encounters in Group 18 to 39, Chronic Condition 1, 2009-2012

	NS												
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P	All
NA	41139	5822	12742	775	115	1642	4	831	2456	3296	3984	14756	87562
PC	4547	32303	24286	1336	258	1450	20	2541	18685	7399	13836	70875	177536
SC	8766	20348	124450	2501	1467	2724	25	7411	19681	15811	20844	75381	299409
UC	146	706	596	3590	12	519	0	360	3147	970	897	14920	25863
Hos	161	228	638	57	780	115	7	9	38	182	1167	1964	5346
ED	337	1403	1320	116	203	12370	3	3711	519	336	1110	7337	28765
IS	3	18	28	0	0	4	131	1	4	2	18	13	222
R	1775	5422	8328	522	346	819	7	3817	789	4416	6193	6051	38485
Lab	4331	14015	18980	1629	565	868	3	6331	32400	17533	19829	19799	136283
E	3489	12457	20041	2105	203	644	7	2339	6546	23226	11213	35875	118145
Tel	3614	18704	16856	6300	463	2703	20	2325	7683	14529	29589	43431	146217
P	19106	65577	70784	6681	929	4819	28	9011	44496	30554	37222	410461	699668
Total	87414	177003	299049	25612	5341	28677	255	38687	136444	118254	145902	700863	1763501

Table B.5: Number of Patient Visit Encounters in Group 18 to 39, Chronic Condition 2, 2001-2004

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P	All
NA	5747	2343	1805	250	72	307	21	754	1080	605	4753	17737
PC	4330	72251	4026	4145	1336	1714	181	2395	16649	1462	81431	189920
SC	856	2768	8133	285	145	392	11	877	2399	1455	9257	26578
UC	47	1328	61	1073	14	557	1	138	1514	59	9671	14463
Hos	163	575	311	110	244	604	21	11	11	105	637	2792
ED	112	2100	166	177	152	6619	8	492	459	95	3314	13694
IS	53	112	48	8	5	12	152	7	158	6	206	767
R	512	4515	949	241	118	173	15	1542	450	635	3243	12393
Lab	1183	21910	2279	1598	221	557	139	2855	8469	2024	20686	61921
Tel	474	1964	1175	876	51	357	6	141	739	2960	5053	13796
P	4280	80146	7707	5629	409	2390	208	3230	29997	4437	320132	458565
Total	17757	190012	26660	14392	2767	13682	763	12442	61925	13843	458383	812626

Table B.6: Number of Patient Visit Encounters in Group 18 to 39, Chronic Condition 2, 2009-2012

	NS												
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P	All
NA	18818	2808	8042	460	103	1049	7	468	1449	2318	2996	9198	47716
PC	2519	15104	14128	665	146	1032	16	1168	9589	4377	8762	41489	98995
SC	5299	10954	72810	1595	743	2055	26	4449	11160	10893	15193	53291	188468
UC	73	463	392	2069	12	435	1	256	2070	677	627	9643	16718
Hos	146	132	371	62	375	121	11	3	15	124	1070	1285	3715
ED	269	959	951	108	226	10109	3	2864	353	363	912	5624	22741
IS	11	12	43	0	2	2	123	1	24	1	16	35	270
R	1054	3123	5100	348	322	649	6	2737	442	2829	3984	4499	25093
Lab	2654	7610	11838	923	372	549	32	4110	20520	11382	12249	12756	84995
E	2340	7419	12597	1793	152	650	3	1372	4598	18680	8471	28442	86517
Tel	2502	11077	11321	4255	360	2367	16	1352	5085	11456	23376	33818	106985
P	12051	39569	50740	4405	873	3687	36	6385	29771	23410	28979	329758	529664
Total	47736	99230	188333	16683	3686	22705	280	25165	85076	86510	106635	529838	1211877

Table B.7: Number of Patient Visit Encounters in Group 40 to 64, Chronic Condition 0, 2001-2004

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P	All
NA	88591	31260	25582	1666	233	1990	93	24243	15967	6725	54036	250386
PC	60664	814227	53678	26184	6493	9695	453	63639	196811	18594	698330	1948768
SC	14473	43466	137508	2960	764	3411	170	18578	27227	16115	110310	374982
UC	456	10079	678	7984	33	2234	4	1703	8039	571	54819	86600
Hos	820	2641	1278	588	467	2849	109	87	104	757	3840	13540
ED	541	11356	758	488	424	32144	40	4484	2641	359	16204	69439
IS	223	369	252	3	23	39	1498	43	208	87	645	3390
R	11203	94327	21920	2893	985	1343	103	39003	9750	13016	72732	267275
Lab	14610	212323	24339	8128	1555	2716	243	46816	88250	27127	176621	602728
Tel	6538	27503	13668	7833	331	2603	74	3285	11298	24129	51894	149156
P	52205	699168	95080	28615	2316	10939	699	64762	243886	41552	2865414	4104636
Total	250324	1946719	374741	87342	13624	69963	3486	266643	604181	149032	4104845	7870900

Table B.8: Number of Patient Visit Encounters in Group 40 to 64, Chronic Condition 0, 2009-2012

	NS												
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P	All
NA	359067	54305	126570	4191	826	8396	162	20985	23382	30469	36422	141071	805846
PC	44226	316129	271188	7614	1309	8074	650	52488	188239	71420	101419	626222	1688978
SC	85492	211145	1271883	15804	5596	19695	994	133166	174436	148950	185166	708979	2961306
UC	834	4187	3385	19991	100	2971	17	2470	15274	5653	4306	73902	133090
Hos	1092	898	3435	448	682	667	441	67	160	884	8996	12004	29774
ED	1661	6981	6521	355	806	55628	78	24749	3491	1495	3934	34592	140291
IS	281	458	1515	8	51	63	2379	80	211	44	626	1488	7204
R	31879	85881	129751	3985	4264	4515	246	81389	15337	58896	69979	113543	599665
Lab	39190	143268	167727	7444	3505	3392	310	90523	245080	167349	155602	206647	1230037
E	32300	110138	191818	11087	1338	2860	79	35278	82768	209010	91435	316484	1084595
Tel	32128	147344	134912	30330	2958	13532	616	30748	79476	124506	219978	341512	1158040
P	175924	606986	653318	32856	8478	21490	1431	126146	403075	265538	282417	4587639	7165298
Total	804074	1687720	2962023	134113	29913	141283	7403	598089	1230929	1084214	1160280	7164083	17004124

Table B.9: Number of Patient Visit Encounters in Group 40 to 64, Chronic Condition 1, 2001-2004

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P	All
NA	35989	13431	12244	718	114	827	118	9364	7552	3155	29968	113480
PC	27219	373779	22287	12440	3680	4292	411	25973	87393	7307	399099	963880
SC	6567	16399	58951	1211	307	1423	90	7737	12399	7704	59359	172147
UC	190	4229	259	3328	18	1002	5	644	3876	202	26843	40596
Hos	439	1528	502	337	182	1625	80	41	50	368	2096	7248
ED	221	4923	323	192	226	14419	25	1823	1400	151	7557	31260
IS	233	295	128	10	10	31	1206	22	203	65	801	3004
R	4348	37150	8655	1065	540	509	54	15063	4215	5041	36846	113486
Lab	6670	99875	10966	3425	753	1159	212	19436	41847	12752	110096	307191
Tel	3013	10568	6201	3225	153	1126	45	1267	5557	11267	27658	70080
P	28750	404577	51999	15327	1317	5308	785	31977	142881	22279	1845015	2550215
Total	113639	966754	172515	41278	7300	31721	3031	113347	307373	70291	2545338	4372587

Table B.10: Number of Patient Visit Encounters in Group 40 to 64, Chronic Condition 1, 2009-2012

	NS												
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P	All
NA	103197	15453	44143	1386	342	2388	70	6086	8224	12098	14757	55135	263279
PC	13874	81348	83780	1869	383	2276	273	13657	51068	23782	33221	207447	512978
SC	27936	59676	401175	4873	1686	6204	455	40281	56847	55297	65059	275512	995001
UC	259	1044	1058	6301	49	906	5	761	5235	1792	1317	24064	42791
Hos	441	246	1106	169	189	210	238	14	38	362	3190	4158	10361
ED	496	1834	1952	105	281	17339	41	7752	1104	515	1220	10835	43474
IS	137	220	747	5	33	24	1096	26	136	31	313	756	3524
R	9824	22105	38694	1133	1402	1241	102	24360	4339	19739	21832	40266	185037
Lab	13804	40852	55747	2281	1171	888	221	28065	84090	60870	53448	76676	418113
E	12632	36336	66898	3883	575	996	56	11357	30713	80943	34647	135540	414576
Tel	12148	44905	45606	10020	1104	4460	288	9094	28402	48264	80550	138534	423375
P	68450	211835	254099	11302	3233	6941	727	43479	148116	110594	114289	1866802	2839867
Total	263198	515854	995005	43327	10448	43873	3572	184932	418312	414287	423843	2835725	6152376

Table B.11: Number of Patient Visit Encounters in Group 40 to 64, Chronic Condition 2, 2001-2004

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P	All
NA	36546	15652	14442	941	224	1050	249	8635	9756	4141	40463	132099
PC	32061	423306	23682	16060	7671	6793	1943	24789	104034	8071	513156	1161566
SC	6885	15698	60352	1409	451	1946	349	7994	15125	9667	70793	190669
UC	244	4732	275	3848	27	1520	15	687	5593	242	34516	51699
Hos	841	2768	852	747	325	3977	219	49	74	705	3384	13941
ED	359	8095	466	293	474	21882	101	2312	2486	202	11132	47802
IS	580	1356	627	40	38	124	2846	92	1337	193	2363	9596
R	4541	36272	8543	1154	770	589	193	15623	4833	5220	40533	118271
Lab	9299	132772	13515	4687	1190	1666	1172	21921	64497	17448	158692	426859
Tel	3682	10890	7483	3700	288	1495	141	1285	7645	15248	36815	88672
P	37093	513272	60788	19478	2451	7092	2336	34919	211312	27830	2673773	3590344
Total	132131	1164813	191025	52357	13909	48134	9564	118306	426692	88967	3585620	5831518

Table B.12: Number of Patient Visit Encounters in Group 40 to 64, Chronic Condition 2, 2009-2012

	NS												
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P	All
NA	104064	14082	50449	1396	480	3165	141	5370	10838	12994	21064	63620	287663
PC	14682	75189	89661	1913	514	2679	623	10526	49686	24390	38923	222458	531244
SC	29583	59316	425169	5342	2298	8548	1102	39915	65555	61594	82360	327257	1108039
UC	344	1201	1156	6430	60	1139	9	716	6624	1892	1516	26897	47984
Hos	752	388	1531	235	323	382	481	20	60	539	5511	5793	16015
ED	856	2109	2729	119	519	23091	65	10650	1411	632	1716	13689	57586
IS	360	471	1753	5	53	62	2227	64	193	63	726	1301	7278
R	9878	20282	39469	1113	2279	1491	230	23192	4345	18899	23195	41719	186092
Lab	17532	45118	67086	2694	1814	1070	317	29828	113175	69336	66133	91247	505350
E	13432	36695	69251	4755	753	1320	129	10516	34761	99168	41726	166487	478993
Tel	16333	50541	55338	11929	1689	6385	729	9363	35700	60945	113837	184084	546873
P	80204	229141	305131	12516	5141	8611	1253	46000	182959	128443	149544	2509982	3658925
Total	288020	534533	1108723	48447	15923	57943	7306	186160	505307	478895	546251	3654534	7432042

Table B.13: Number of Patient Visit Encounters in Group 65 and up, Chronic Condition 0, 2001-2004

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P	All
NA	19571	7979	6845	289	104	706	455	6448	5496	2672	13961	64526
PC	15439	181188	11973	4410	3897	3365	2006	15513	55185	4880	159096	456952
SC	3356	10788	34099	580	308	1048	650	4784	7777	5275	28148	96813
UC	73	1773	131	1303	13	438	10	273	1843	118	7250	13225
Hos	409	1408	606	270	134	2300	351	53	50	569	1267	7417
ED	223	4399	199	81	265	10179	246	1647	1437	128	3539	22343
IS	839	1533	1036	30	40	150	7885	236	1347	347	4080	17523
R	3299	22046	5794	375	617	341	364	10315	3218	3743	16912	67024
Lab	4862	61943	7681	1348	722	781	1418	12672	36595	13215	59407	200644
Tel	2411	7646	4723	1495	240	955	266	955	6240	8623	17798	51352
P	13990	156696	23595	3574	1031	2164	3844	13996	81327	11736	653124	965077
Total	64472	457399	96682	13755	7371	22427	17495	66892	200515	51306	964582	1962896

Table B.14: Number of Patient Visit Encounters in Group 65 and up, Chronic Condition 0, 2009-2012

	NS												
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P	All
NA	126464	13549	39882	1036	599	3083	611	6554	13060	9640	30165	51957	296600
PC	14315	75965	99006	1834	855	2229	3042	15014	65257	24529	42277	195818	540141
SC	21748	67662	385976	4426	2829	7114	5213	39235	68467	51216	83283	262026	999195
UC	316	1318	1016	5952	60	826	56	588	6798	1367	1404	16135	35836
Hos	803	475	1641	317	278	455	1769	20	83	545	6866	5346	18598
ED	728	1824	2007	75	384	15729	277	10836	1282	380	1615	7505	42642
IS	1136	2215	7787	25	176	180	10940	319	1181	228	2413	7846	34446
R	10972	22383	41183	840	2863	1035	1102	28605	5729	17734	27671	34910	195027
Lab	20241	55608	72019	2454	2295	961	1622	32424	122904	70876	77596	101449	560449
E	10258	36488	68246	2613	695	846	339	11361	39997	70078	30709	104342	375972
Tel	23153	60895	56329	10091	2303	6081	2229	12170	48591	45066	108505	160509	535922
P	67474	206175	224764	7021	5210	4826	6976	37651	186229	83278	123433	1638915	2591952
Total	297608	544557	999856	36684	18547	43365	34176	194777	559578	374937	535937	2586758	6226780

Table B.15: Number of Patient Visit Encounters in Group 65 and up, Chronic Condition 1, 2001-2004

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P	All
NA	22308	8931	7285	362	132	729	531	5861	6080	3278	16766	72263
PC	16580	193855	12358	4743	4486	3726	2814	14963	59483	4903	192380	510291
SC	3582	9974	31456	610	312	1087	916	4445	8112	5610	31268	97372
UC	91	1809	138	1472	17	489	11	337	2059	101	7920	14444
Hos	463	1562	510	293	148	2691	467	41	84	609	1403	8271
ED	195	5016	212	83	248	11502	285	1658	1599	110	4202	25110
IS	1018	2033	1458	41	66	198	9149	279	1575	431	4601	20849
R	3149	21093	5068	324	628	344	497	9645	3212	3568	17975	65503
Lab	5252	68653	7385	1429	763	860	1549	12687	39743	14614	71692	224627
Tel	2868	7705	4962	1507	261	1022	367	870	6436	9320	20339	55657
P	16717	190828	26595	4012	1220	2608	4269	14652	96101	13137	817526	1187665
Total	72223	511459	97427	14876	8281	25256	20855	65438	224484	55681	1186072	2282052

Table B.16: Number of Patient Visit Encounters in Group 65 and up, Chronic Condition 1, 2009-2012

	NS												
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P	All
NA	105670	10011	29761	809	525	2417	490	4019	11151	7526	27359	44470	244208
PC	10981	46502	65968	1123	647	1516	2358	8384	44703	15766	31815	132915	362678
SC	15754	43299	239726	3120	1708	4856	3614	22826	47993	34529	61237	186999	665661
UC	261	885	698	4091	58	658	62	395	5363	885	1125	11589	26070
Hos	649	349	1101	261	158	273	1584	12	58	451	5227	3549	13672
ED	612	1240	1266	43	277	11080	261	7908	965	316	1154	5188	30310
IS	1044	1934	5698	19	155	125	10786	277	1008	187	2163	5577	28973
R	7454	13395	24303	615	2090	586	746	17315	3506	10703	19085	22686	122484
Lab	17079	37377	50391	1810	1772	602	1480	22085	94397	49378	60595	77923	414889
E	7602	23444	44642	1767	517	597	299	6890	27327	46180	21653	76531	257449
Tel	20450	43452	40813	7670	1764	4768	1991	7924	37658	31691	85546	132571	416298
P	56899	143417	161476	5154	4026	3120	5234	24453	140401	59527	99389	1263767	1966863
Total	244455	365305	665843	26482	13697	30598	28905	122488	414530	257139	416348	1963765	4549555

Table B.17: Number of Patient Visit Encounters in Group 65 and up, Chronic Condition 2, 2001-2004

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P	All
NA	62226	29526	20001	1218	579	2694	2306	12363	18473	11618	64496	225500
PC	48127	575588	31629	16943	20020	16056	14770	33269	188648	13767	645452	1604269
SC	8622	23571	76650	1709	915	3749	3539	11157	22935	16522	88786	258155
UC	316	5625	327	4228	39	1914	81	777	8073	288	26865	48533
Hos	1643	5931	1699	1441	463	13106	1895	157	204	2272	4904	33715
ED	885	20034	649	289	1045	44540	1298	5637	6960	408	18253	99998
IS	4649	10307	5984	203	281	1105	42068	1099	9787	1885	26783	104151
R	7623	50189	12059	924	1969	925	1915	22456	8304	9211	47508	163083
Lab	19413	232683	20019	5209	2610	3624	10000	34465	147574	48995	278330	802922
Tel	9352	21381	14460	4614	899	3197	1654	2314	20374	30683	66949	175877
P	62488	633608	74886	12629	4863	9421	24469	39340	370370	40395	3119996	4392465
Total	225344	1608443	258363	49407	33683	100331	103995	163034	801702	176044	4388322	7908668

Table B.18: Number of Patient Visit Encounters in Group 65 and up, Chronic Condition 2, 2009-2012

	NS												
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P	All
NA	239996	20599	59669	1696	1362	4934	1378	5971	26014	14474	72212	103299	551604
PC	23117	82710	120287	2272	1295	3337	6196	12158	80467	26478	66890	244411	669618
SC	30736	73850	421274	6751	3682	11457	9505	37477	93186	57451	127626	353620	1226615
UC	566	1878	1417	8939	113	1509	149	814	12262	1587	2253	23930	55417
Hos	1701	807	2305	594	378	665	3965	16	90	958	12591	7651	31721
ED	1493	2596	2897	124	699	26538	685	18623	2251	584	2784	12103	71377
IS	3061	5090	14871	62	387	411	28480	784	3051	522	6076	16081	78876
R	13869	22859	42416	1115	4954	1376	2093	30703	5920	16577	35729	39284	216895
Lab	39272	71320	98164	3972	4164	1371	4670	42150	209212	94084	129413	161666	859458
E	15072	38750	71841	3771	1194	1476	789	10058	49562	81113	41570	143666	458862
Tel	50627	87100	82420	16804	4186	11793	5712	14366	80587	62990	200372	295045	912002
P	132541	266271	309578	9938	9221	7006	15065	43861	296207	101819	213752	2765494	4170753
Total	552051	673830	1227139	56038	31635	71873	78687	216981	858809	458637	911268	4166250	9303198

Appendix C

Tables in this appendix describe the transition probabilities of a patient visit encounter between current health care state and next health care state. The health care states are Not Application (abbreviated as NA), Primary Care (PC), Specialty Care (SC), Urgent Care (UC), Hospital (Hos), Emergency Department (ED), Institutional Stay (IS), Radiology (R), Email (E), Laboratory (Lab), Telephone (Tel), and Pharmacy (P).

The interpretation of the table can be found in section 3.1.

Table C.1: Transition Probabilities of Patient Visit Encounters in Group 18 to 39, Chronic Condition 0, 2001-2004 (divide each cell value by 100)

	Next State (NS)										
Current State (CS)	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	39.85	13.43	9.58	1.15	0.40	1.46	0.02	6.23	6.20	3.53	18.16
PC	2.45	41.39	**3.34**	2.15	0.64	0.73	0.01	1.76	11.39	1.29	34.86
SC	2.81	13.65	35.38	1.08	1.30	1.05	0.01	3.94	12.48	4.36	23.95
UC	0.38	11.70	0.72	9.97	0.04	2.93	0.00	1.65	11.48	0.72	60.41
Hos	5.94	19.70	23.28	1.55	20.33	6.48	0.10	0.29	1.33	4.01	16.98
ED	0.67	16.79	1.48	1.38	0.49	48.23	0.02	4.89	3.19	0.77	22.08
IS	8.87	13.91	7.67	0.48	0.72	3.36	40.77	1.44	6.00	1.44	15.35
R	3.94	39.45	12.41	1.94	0.68	1.27	0.01	11.98	5.06	6.25	17.01
Lab	2.02	40.20	6.16	2.88	0.42	1.06	0.01	5.88	13.87	4.70	22.82
Tel	3.68	21.86	8.60	7.56	0.40	2.27	0.01	1.42	6.20	18.84	29.17
P	1.14	21.96	2.46	1.57	0.08	0.64	0.01	1.08	8.48	1.55	61.04

Table C.2: Transition Probabilities of Patient Visit Encounters in Group 18 to 39, Chronic Condition 0, 2009-2012 (divide each cell value by 100)

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	49.99	7.78	14.15	0.91	0.16	1.99	0.01	1.35	2.80	3.20	4.04	13.63
PC	2.31	22.02	13.24	0.82	0.20	0.89	0.01	1.68	12.46	3.82	7.25	35.29
SC	2.66	7.89	44.08	0.91	0.75	1.00	0.01	2.96	7.87	4.73	6.75	20.40
UC	0.52	3.33	2.28	15.91	0.05	2.26	0.00	1.80	11.73	3.41	3.81	54.90
Hos	2.62	6.58	13.01	0.80	18.11	1.83	0.08	0.10	1.09	3.58	17.18	35.01
ED	1.16	6.03	4.74	0.55	0.66	42.60	0.01	13.25	2.11	1.11	3.44	24.34
IS	1.57	2.41	17.01	0.12	0.72	1.09	51.75	0.36	1.21	0.24	6.51	17.01
R	4.51	15.97	23.41	1.36	0.89	2.11	0.01	10.77	2.48	9.78	15.95	12.76
Lab	2.82	12.44	14.85	1.26	0.52	0.69	0.01	4.57	24.35	11.37	14.56	12.57
E	2.84	12.67	19.01	1.85	0.19	0.50	0.00	2.31	5.81	19.56	9.60	25.64
Tel	2.25	15.71	12.45	4.49	0.37	1.81	0.01	1.93	5.98	9.07	20.19	25.74
P	2.56	11.37	10.18	1.06	0.14	0.77	0.01	1.55	7.81	4.31	5.44	54.80

Table C.3: Transition Probabilities of Patient Visit Encounters in Group 18 to 39, Chronic Condition 1, 2001-2004 (divide each cell value by 100)

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	39.51	12.92	9.32	1.10	0.34	1.31	0.08	5.14	5.68	3.11	21.51
PC	2.40	39.51	2.70	2.09	0.57	0.68	0.02	1.54	9.38	0.88	40.24
SC	3.24	12.03	33.27	0.95	0.84	0.92	0.01	3.68	10.81	4.44	29.84
UC	0.41	9.84	0.54	8.57	0.05	3.01	0.00	1.26	11.04	0.52	64.77
Hos	5.24	19.01	18.73	2.62	15.14	11.70	0.18	0.20	0.70	4.54	21.95
ED	0.67	15.62	1.05	1.35	0.57	48.11	0.01	4.06	3.35	0.71	24.50
IS	29.78	13.33	4.89	0.00	0.44	2.22	24.44	0.44	7.11	1.78	15.56
R	3.68	38.04	9.36	1.95	0.61	1.34	0.07	11.73	4.25	5.65	23.34
Lab	1.96	36.84	4.79	2.77	0.31	0.99	0.02	5.11	12.86	3.86	30.49
Tel	3.69	17.71	8.35	6.61	0.36	2.35	0.01	1.35	6.17	18.84	34.57
P	1.01	19.29	2.04	1.37	0.07	0.51	0.01	0.82	6.79	1.17	66.92

Table C.4: Transition Probabilities of Patient Visit Encounters in Group 18 to 39, Chronic Condition 1, 2009-2012 (divide each cell value by 100)

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	46.98	6.65	14.55	0.89	0.13	1.88	0.01	0.95	2.81	3.76	4.55	16.85
PC	2.56	18.20	13.68	0.75	0.15	0.82	0.01	1.43	10.52	4.17	7.79	39.92
SC	2.93	6.80	41.57	0.84	0.49	0.91	0.01	2.48	6.57	5.28	6.96	25.18
UC	0.57	2.73	2.30	13.88	0.05	2.01	0.00	1.39	12.17	3.75	3.47	57.69
Hos	3.01	4.27	11.93	1.07	14.59	2.15	0.13	0.17	0.71	3.40	21.83	36.74
ED	1.17	4.88	4.59	0.40	0.71	43.00	0.01	12.90	1.80	1.17	3.86	25.51
IS	1.35	8.11	12.61	0.00	0.00	1.80	59.01	0.45	1.80	0.90	8.11	5.86
R	4.61	14.09	21.64	1.36	0.90	2.13	0.02	9.92	2.05	11.47	16.09	15.72
Lab	3.18	10.28	13.93	1.20	0.42	0.64	0.00	4.65	23.77	12.87	14.55	14.53
E	2.95	10.54	16.96	1.78	0.17	0.55	0.01	1.98	5.54	19.66	9.49	30.37
Tel	2.47	12.79	11.53	4.31	0.32	1.85	0.01	1.59	5.26	9.94	20.24	29.70
P	2.73	9.37	10.12	0.96	0.13	0.69	0.00	1.29	6.36	4.37	5.32	58.67

Table C.5: Transition Probabilities of Patient Visit Encounters in Group 18 to 39, Chronic Condition 2, 2001-2004 (divide each cell value by 100)

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	32.40	13.21	10.18	1.41	0.41	1.73	0.12	4.25	6.09	3.41	26.80
PC	2.28	38.04	2.12	2.18	0.70	0.90	0.10	1.26	8.77	0.77	42.88
SC	3.22	10.41	30.60	1.07	0.55	1.48	0.04	3.30	9.03	5.47	34.83
UC	0.33	9.18	0.42	7.42	0.10	3.85	0.01	0.95	10.47	0.41	66.87
Hos	5.84	20.59	11.14	3.94	8.74	21.63	0.75	0.39	0.39	3.76	22.82
ED	0.82	15.34	1.21	1.29	1.11	48.34	0.06	3.59	3.35	0.69	24.20
IS	6.91	14.60	6.26	1.04	0.65	1.57	19.82	0.91	20.60	0.78	26.86
R	4.13	36.43	7.66	1.95	0.95	1.40	0.12	12.44	3.63	5.12	26.17
Lab	1.91	35.38	3.68	2.58	0.36	0.90	0.22	4.61	13.68	3.27	33.41
Tel	3.44	14.24	8.52	6.35	0.37	2.59	0.04	1.02	5.36	21.46	36.63
P	0.93	17.48	1.68	1.23	0.09	0.52	0.05	0.70	6.54	0.97	69.81

Table C.6: Transition Probabilities of Patient Visit Encounters in Group 18 to 39, Chronic Condition 2, 2009-2012 (divide each cell value by 100)

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	39.44	5.89	16.85	0.96	0.22	2.20	0.02	0.98	3.04	4.86	6.28	19.28
PC	2.55	15.26	14.27	0.67	0.15	1.04	0.02	1.18	9.69	4.42	8.85	41.91
SC	2.81	5.81	38.63	0.85	0.39	1.09	0.01	2.36	5.92	5.78	8.06	28.28
UC	0.44	2.77	2.35	12.38	0.07	2.60	0.01	1.53	12.38	4.05	3.75	57.68
Hos	3.93	3.55	9.99	1.67	10.09	3.26	0.30	0.08	0.40	3.34	28.80	34.59
ED	1.18	4.22	4.18	0.48	0.99	44.45	0.01	12.59	1.55	1.60	4.01	24.73
IS	4.07	4.44	15.93	0.00	0.74	0.74	45.56	0.37	8.89	0.37	5.93	12.96
R	4.20	12.45	20.32	1.39	1.28	2.59	0.02	10.91	1.76	11.27	15.88	17.93
Lab	3.12	8.95	13.93	1.09	0.44	0.65	0.04	4.84	24.14	13.39	14.41	15.01
E	2.71	8.58	14.56	2.07	0.18	0.75	0.00	1.59	5.32	21.59	9.79	32.87
Tel	2.34	10.35	10.58	3.98	0.34	2.21	0.02	1.26	4.75	10.71	21.85	31.61
P	2.28	7.47	9.58	0.83	0.17	0.70	0.01	1.21	5.62	4.42	5.47	62.26

Table C.7: Transition Probabilities of Patient Visit Encounters in Group 40 to 64, Chronic Condition 0, 2001-2004 (divide each cell value by 100)

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	35.38	12.48	10.22	0.67	0.09	0.80	0.04	9.68	6.38	2.69	21.58
PC	3.11	41.78	2.75	1.34	0.33	0.50	0.02	3.27	10.10	0.95	35.83
SC	3.86	11.59	36.67	0.79	0.20	0.91	0.05	4.95	7.26	4.30	29.42
UC	0.53	11.64	0.78	9.22	0.04	2.58	0.01	1.97	9.28	0.66	63.30
Hos	6.06	19.51	9.44	4.34	3.45	21.04	0.81	0.64	0.77	5.59	28.36
ED	0.78	16.35	1.09	0.70	0.61	46.29	0.06	6.46	3.80	0.52	23.34
IS	6.58	10.88	7.43	0.09	0.68	1.15	44.19	1.27	6.14	2.57	19.03
R	4.19	35.29	8.20	1.08	0.37	0.50	0.04	14.59	3.65	4.87	27.21
Lab	2.42	35.23	4.04	1.35	0.26	0.45	0.04	7.77	14.64	4.50	29.30
Tel	4.38	18.44	9.16	5.25	0.22	1.75	0.05	2.20	7.58	16.18	34.79
P	1.27	17.03	2.32	0.70	0.06	0.27	0.02	1.58	5.94	1.01	69.81

Table C.8: Transition Probabilities of Patient Visit Encounters in Group 40 to 64, Chronic Condition 0, 2009-2012 (divide each cell value by 100)

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	44.56	6.74	15.71	0.52	0.10	1.04	0.02	2.60	2.90	3.78	4.52	17.51
PC	2.62	18.72	16.06	0.45	0.08	0.48	0.04	3.11	11.15	4.23	6.01	37.08
SC	2.89	7.13	42.95	0.53	0.19	0.67	0.03	4.50	5.89	5.03	6.25	23.94
UC	0.63	3.15	2.54	15.02	0.08	2.23	0.01	1.86	11.48	4.25	3.24	55.53
Hos	3.67	3.02	11.54	1.51	2.29	2.24	1.48	0.23	0.54	2.97	30.21	40.32
ED	1.18	4.98	4.65	0.25	0.58	39.65	0.06	17.64	2.49	1.07	2.80	24.66
IS	3.90	6.36	21.03	0.11	0.71	0.88	33.02	1.11	2.93	0.61	8.69	20.66
R	5.32	14.32	21.64	0.67	0.71	0.75	0.04	13.57	2.56	9.82	11.67	18.93
Lab	3.19	11.65	13.64	0.61	0.29	0.28	0.03	7.36	19.92	13.61	12.65	16.80
E	2.98	10.15	17.69	1.02	0.12	0.26	0.01	3.25	7.63	19.27	8.43	29.18
Tel	2.77	12.72	11.65	2.62	0.26	1.17	0.05	2.66	6.86	10.75	19.00	29.49
P	2.46	8.47	9.12	0.46	0.12	0.30	0.02	1.76	5.63	3.71	3.94	64.03

Table C.9: Transition Probabilities of Patient Visit Encounters in Group 40 to 64, Chronic Condition 1, 2001-2004 (divide each cell value by 100)

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	31.71	11.84	10.79	0.63	0.10	0.73	0.10	8.25	6.66	2.78	26.41
PC	2.82	38.78	2.31	1.29	0.38	0.45	0.04	2.70	9.07	0.76	41.41
SC	3.82	9.53	34.24	0.70	0.18	0.83	0.05	4.49	7.20	4.48	34.48
UC	0.47	10.42	0.64	8.20	0.04	2.47	0.01	1.59	9.55	0.50	66.12
Hos	6.06	21.08	6.93	4.65	2.51	22.42	1.10	0.57	0.69	5.08	28.92
ED	0.71	15.75	1.03	0.61	0.72	46.13	0.08	5.83	4.48	0.48	24.17
IS	7.76	9.82	4.26	0.33	0.33	1.03	40.15	0.73	6.76	2.16	26.66
R	3.83	32.74	7.63	0.94	0.48	0.45	0.05	13.27	3.71	4.44	32.47
Lab	2.17	32.51	3.57	1.12	0.25	0.38	0.07	6.33	13.62	4.15	35.84
Tel	4.30	15.08	8.85	4.60	0.22	1.61	0.06	1.81	7.93	16.08	39.47
P	1.13	15.86	2.04	0.60	0.05	0.21	0.03	1.25	5.60	0.87	72.35

Table C.10: Transition Probabilities of Patient Visit Encounters in Group 40 to 64, Chronic Condition 1, 2009-2012 (divide each cell value by 100)

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	39.20	5.87	16.77	0.53	0.13	0.91	0.03	2.31	3.12	4.60	5.61	20.94
PC	2.71	15.86	16.33	0.36	0.08	0.44	0.05	2.66	9.96	4.64	6.48	40.44
SC	2.81	6.00	40.32	0.49	0.17	0.62	0.05	4.05	5.71	5.56	6.54	27.69
UC	0.61	2.44	2.47	14.73	0.12	2.12	0.01	1.78	12.23	4.19	3.08	56.24
Hos	4.26	2.37	10.67	1.63	1.82	2.03	2.30	0.14	0.37	3.49	30.79	40.13
ED	1.14	4.22	4.49	0.24	0.65	39.88	0.09	17.83	2.54	1.19	2.81	24.92
IS	3.89	6.24	21.20	0.14	0.94	0.68	31.10	0.74	3.86	0.88	8.88	21.45
R	5.31	11.95	20.91	0.61	0.76	0.67	0.06	13.16	2.35	10.67	11.80	21.76
Lab	3.30	9.77	13.33	0.55	0.28	0.21	0.05	6.71	20.11	14.56	12.78	18.34
E	3.05	8.77	16.14	0.94	0.14	0.24	0.01	2.74	7.41	19.52	8.36	32.69
Tel	2.87	10.61	10.77	2.37	0.26	1.05	0.07	2.15	6.71	11.40	19.03	32.72
P	2.41	7.46	8.95	0.40	0.11	0.24	0.03	1.53	5.22	3.89	4.02	65.74

Table C.11: Transition Probabilities of Patient Visit Encounters in Group 40 to 64, Chronic Condition 2, 2001-2004 (divide each cell value by 100)

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	27.67	11.85	10.93	0.71	0.17	0.80	0.19	6.54	7.39	3.14	30.63
PC	2.76	36.44	2.04	1.38	0.66	0.59	0.17	2.13	8.96	0.70	44.18
SC	3.61	8.23	31.65	0.74	0.24	1.02	0.18	4.19	7.93	5.07	37.13
UC	0.47	9.15	0.53	7.44	0.05	2.94	0.03	1.33	10.82	0.47	66.76
Hos	6.03	19.86	6.11	5.36	2.33	28.53	1.57	0.35	0.53	5.06	24.27
ED	0.75	16.93	0.98	0.61	0.99	45.78	0.21	4.84	5.20	0.42	23.29
IS	6.04	14.13	6.53	0.42	0.40	1.29	29.66	0.96	13.93	2.01	24.62
R	3.84	30.67	7.22	0.98	0.65	0.50	0.16	13.21	4.09	4.41	34.27
Lab	2.18	31.10	3.17	1.10	0.28	0.39	0.28	5.14	15.11	4.09	37.18
Tel	4.15	12.28	8.44	4.17	0.33	1.69	0.16	1.45	8.62	17.20	41.52
P	1.03	14.30	1.69	0.54	0.07	0.20	0.07	0.97	5.89	0.78	74.47

Table C.12: Transition Probabilities of Patient Visit Encounters in Group 40 to 64, Chronic Condition 2, 2009-2012 (divide each cell value by 100)

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	36.18	4.90	17.54	0.49	0.17	1.10	0.05	1.87	3.77	4.52	7.32	22.12
PC	2.76	14.15	16.88	0.36	0.10	0.50	0.12	1.98	9.35	4.59	7.33	41.87
SC	2.67	5.35	38.37	0.48	0.21	0.77	0.10	3.60	5.92	5.56	7.43	29.53
UC	0.72	2.50	2.41	13.40	0.13	2.37	0.02	1.49	13.80	3.94	3.16	56.05
Hos	4.70	2.42	9.56	1.47	2.02	2.39	3.00	0.13	0.38	3.37	34.41	36.17
ED	1.49	3.66	4.74	0.21	0.90	40.10	0.11	18.49	2.45	1.10	2.98	23.77
IS	4.95	6.47	24.09	0.07	0.73	0.85	30.60	0.88	2.65	0.87	9.98	17.88
R	5.31	10.90	21.21	0.60	1.23	0.80	0.12	12.46	2.34	10.16	12.46	22.42
Lab	3.47	8.93	13.28	0.53	0.36	0.21	0.06	5.90	22.40	13.72	13.09	18.06
E	2.80	7.66	14.46	0.99	0.16	0.28	0.03	2.20	7.26	20.70	8.71	34.76
Tel	2.99	9.24	10.12	2.18	0.31	1.17	0.13	1.71	6.53	11.14	20.82	33.66
P	2.19	6.26	8.34	0.34	0.14	0.24	0.03	1.26	5.00	3.51	4.09	68.60

Table C.13: Transition Probabilities of Patient Visit Encounters in Group 65 and up, Chronic Condition 0, 2001-2004 (divide each cell value by 100)

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	30.33	12.37	10.61	0.45	0.16	1.09	0.71	9.99	8.52	4.14	21.64
PC	3.38	39.65	2.62	0.97	0.85	0.74	0.44	3.40	12.08	1.07	34.82
SC	3.47	11.14	35.22	0.60	0.32	1.08	0.67	4.94	8.03	5.45	29.07
UC	0.55	13.41	0.99	9.85	0.10	3.31	0.08	2.06	13.94	0.89	54.82
Hos	5.51	18.98	8.17	3.64	1.81	31.01	4.73	0.72	0.67	7.67	17.08
ED	1.00	19.69	0.89	0.36	1.19	45.56	1.10	7.37	6.43	0.57	15.84
IS	4.79	8.75	5.91	0.17	0.23	0.86	45.00	1.35	7.69	1.98	23.28
R	4.92	32.89	8.65	0.56	0.92	0.51	0.54	15.39	4.80	5.59	25.23
Lab	2.42	30.87	3.83	0.67	0.36	0.39	0.71	6.32	18.24	6.59	29.61
Tel	4.70	14.89	9.20	2.91	0.47	1.86	0.52	1.86	12.15	16.79	34.66
P	1.45	16.24	2.45	0.37	0.11	0.22	0.40	1.45	8.43	1.22	67.68

Table C.14: Transition Probabilities of Patient Visit Encounters in Group 65 and up, Chronic Condition 0, 2009-2012 (divide each cell value by 100)

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	42.64	4.57	13.45	0.35	0.20	1.04	0.21	2.21	4.40	3.25	10.17	17.52
PC	2.65	14.06	18.33	0.34	0.16	0.41	0.56	2.78	12.08	4.54	7.83	36.25
SC	2.18	6.77	38.63	0.44	0.28	0.71	0.52	3.93	6.85	5.13	8.34	26.22
UC	0.88	3.68	2.84	16.61	0.17	2.31	0.16	1.64	18.97	3.82	3.92	45.02
Hos	4.32	2.55	8.82	1.70	1.50	2.45	9.51	0.11	0.45	2.93	36.92	28.75
ED	1.71	4.28	4.71	0.18	0.90	36.89	0.65	25.41	3.01	0.89	3.79	17.60
IS	3.30	6.43	22.61	0.07	0.51	0.52	31.76	0.93	3.43	0.66	7.01	22.78
R	5.63	11.48	21.12	0.43	1.47	0.53	0.57	14.67	2.94	9.09	14.19	17.90
Lab	3.61	9.92	12.85	0.44	0.41	0.17	0.29	5.79	21.93	12.65	13.85	18.10
E	2.73	9.71	18.15	0.70	0.19	0.23	0.09	3.02	10.64	18.64	8.17	27.75
Tel	4.32	11.36	10.51	1.88	0.43	1.14	0.42	2.27	9.07	8.41	20.25	29.95
P	2.60	7.95	8.67	0.27	0.20	0.19	0.27	1.45	7.19	3.21	4.76	63.23

Table C.15: Transition Probabilities of Patient Visit Encounters in Group 65 and up, Chronic Condition 1, 2001-2004 (divide each cell value by 100)

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	30.87	12.36	10.08	0.50	0.18	1.01	0.74	8.11	8.41	4.54	23.20
PC	3.25	37.99	2.42	0.93	0.88	0.73	0.55	2.93	11.66	0.96	37.70
SC	3.68	10.24	32.30	0.63	0.32	1.12	0.94	4.57	8.33	5.76	32.11
UC	0.63	12.52	0.96	10.19	0.12	3.39	0.08	2.33	14.26	0.70	54.83
Hos	5.60	18.89	6.17	3.54	1.79	32.54	5.65	0.50	1.02	7.36	16.96
ED	0.78	19.98	0.84	0.33	0.99	45.81	1.14	6.60	6.37	0.44	16.73
IS	4.88	9.75	6.99	0.20	0.32	0.95	43.88	1.34	7.55	2.07	22.07
R	4.81	32.20	7.74	0.50	0.96	0.53	0.76	14.72	4.90	5.45	27.44
Lab	2.34	30.56	3.29	0.64	0.34	0.38	0.69	5.65	17.69	6.51	31.92
Tel	5.15	13.84	8.92	2.71	0.47	1.84	0.66	1.56	11.56	16.75	36.54
P	1.41	16.07	2.24	0.34	0.10	0.22	0.36	1.23	8.09	1.11	68.83

Table C.16: Transition Probabilities of Patient Visit Encounters in Group 65 and up, Chronic Condition 1, 2009-2012 (divide each cell value by 100)

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	43.27	4.10	12.19	0.33	0.22	0.99	0.20	1.65	4.57	3.08	11.20	18.21
PC	3.03	12.82	18.19	0.31	0.18	0.42	0.65	2.31	12.33	4.35	8.77	36.65
SC	2.37	6.51	36.01	0.47	0.26	0.73	0.54	3.43	7.21	5.19	9.20	28.09
UC	1.00	3.40	2.68	15.69	0.22	2.52	0.24	1.52	20.57	3.40	4.32	44.45
Hos	4.75	2.55	8.05	1.91	1.16	2.00	11.59	0.09	0.42	3.30	38.23	25.96
ED	2.02	4.09	4.18	0.14	0.91	36.56	0.86	26.09	3.18	1.04	3.81	17.12
IS	3.60	6.68	19.67	0.07	0.54	0.43	37.23	0.96	3.48	0.65	7.47	19.25
R	6.09	10.94	19.84	0.50	1.71	0.48	0.61	14.14	2.86	8.74	15.58	18.52
Lab	4.12	9.01	12.15	0.44	0.43	0.15	0.36	5.32	22.75	11.90	14.61	18.78
E	2.95	9.11	17.34	0.69	0.20	0.23	0.12	2.68	10.61	17.94	8.41	29.73
Tel	4.91	10.44	9.80	1.84	0.42	1.15	0.48	1.90	9.05	7.61	20.55	31.85
P	2.89	7.29	8.21	0.26	0.21	0.16	0.27	1.24	7.14	3.03	5.05	64.25

Table C.17: Transition Probabilities of Patient Visit Encounters in Group 65 and up, Chronic Condition 2, 2001-2004 (divide each cell value by 100)

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	27.59	13.09	8.87	0.54	0.26	1.20	1.02	5.48	8.19	5.15	28.60
PC	3.00	35.88	1.97	1.06	1.25	1.00	0.92	2.07	11.76	0.86	40.23
SC	3.34	9.13	29.69	0.66	0.35	1.45	1.37	4.32	8.88	6.40	34.39
UC	0.65	11.59	0.67	8.71	0.08	3.94	0.17	1.60	16.63	0.59	55.35
Hos	4.87	17.59	5.04	4.27	1.37	38.87	5.62	0.47	0.61	6.74	14.55
ED	0.89	20.03	0.65	0.29	1.05	44.54	1.30	5.64	6.96	0.41	18.25
IS	4.46	9.90	5.75	0.20	0.27	1.06	40.39	1.06	9.40	1.81	25.72
R	4.67	30.78	7.39	0.57	1.21	0.57	1.17	13.77	5.09	5.65	29.13
Lab	2.42	28.98	2.49	0.65	0.33	0.45	1.25	4.29	18.38	6.10	34.66
Tel	5.32	12.16	8.22	2.62	0.51	1.82	0.94	1.32	11.58	17.45	38.07
P	1.42	14.42	1.71	0.29	0.11	0.21	0.56	0.90	8.43	0.92	71.03

Table C.18: Transition Probabilities of Patient Visit Encounters in Group 65 and up, Chronic Condition 2, 2009-2012 (divide each cell value by 100)

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	43.51	3.73	10.82	0.31	0.25	0.89	0.25	1.08	4.72	2.62	13.09	18.73
PC	3.45	12.35	17.96	0.34	0.19	0.50	0.93	1.82	12.02	3.95	9.99	36.50
SC	2.51	6.02	34.34	0.55	0.30	0.93	0.78	3.06	7.60	4.68	10.40	28.83
UC	1.02	3.39	2.56	16.13	0.20	2.72	0.27	1.47	22.13	2.86	4.07	43.18
Hos	5.36	2.54	7.27	1.87	1.19	2.10	12.50	0.05	0.28	3.02	39.69	24.12
ED	2.09	3.64	4.06	0.17	0.98	37.18	0.96	26.09	3.15	0.82	3.90	16.96
IS	3.88	6.45	18.85	0.08	0.49	0.52	36.11	0.99	3.87	0.66	7.70	20.39
R	6.39	10.54	19.56	0.51	2.28	0.63	0.97	14.16	2.73	7.64	16.47	18.11
Lab	4.57	8.30	11.42	0.46	0.48	0.16	0.54	4.90	24.34	10.95	15.06	18.81
E	3.29	8.45	15.66	0.82	0.26	0.32	0.17	2.19	10.80	17.68	9.06	31.31
Tel	5.55	9.55	9.04	1.84	0.46	1.29	0.63	1.58	8.84	6.91	21.97	32.35
P	3.18	6.38	7.42	0.24	0.22	0.17	0.36	1.05	7.10	2.44	5.13	66.31

Appendix D

Tables in this appendix provide the transition time of a patient visit encounter between current health care state and next health care state. The health care states are Not Application (abbreviated as NA), Primary Care (PC), Specialty Care (SC), Urgent Care (UC), Hospital (Hos), Emergency Department (ED), Institutional Stay (IS), Radiology (R), Email (E), Laboratory (Lab), Telephone (Tel), and Pharmacy (P).

The interpretation of the table can be found in section 3.1. Insufficient data is labeled as dot in the entry.

Table D.1.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 18 to 39, Chronic Condition 0, 2001-2004

	Next State (NS)										
Current State (CS)	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	8.65	149.7	9.79	116.24	14.9	44.35	54.08	4.66	19.88	15.72	74.36
PC	19.43	46.63	28.33	58.72	7.43	79.68	163.53	16.05	8.72	56.13	23.71
SC	30.13	208.1	10.39	160.84	11.45	88.28	186.93	14.91	14.86	18.48	85.08
UC	83.46	122.55	84.19	22.1	46	21.53	844	8.31	6.05	91.56	11.51
Hos	7.35	43.95	5.05	37.7	1.93	11.44	2.57	40.39	50.24	5.65	23.5
ED	63.26	112.45	65.67	112.71	29.97	4.17	199.07	5.61	27.44	95.3	46.93
IS	1.84	90.26	1.22	2.5	6	3.43	3.58	1.67	4.44	174.67	64.63
R	28.59	93.24	21.18	122.26	20.95	89.85	96.93	7.3	52.48	19.46	135.63
Lab	49.43	90.7	33.93	96.98	34.78	117.16	302.78	12.36	20.18	35.82	83.65
Tel	28.18	201.69	20.76	36.18	31.36	57.29	1018.64	52.97	43.9	13.44	107.46
P	52.95	103.35	44.13	108.34	95.14	127.34	468	29.11	15.65	52.01	35.64

Table D.1.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 18 to 39, Chronic Condition 0, 2001-2004

	Next State (NS)										
Current State (CS)	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.08	0.18	0.04	0.13	0.03	0.06	0.05	0	0.02	0.09	0.07
PC	0.04	0.1	0.06	0.12	0.01	0.18	0.16	0.03	0.02	0.13	0.03
SC	0.06	0.25	0.1	0.19	0.02	0.1	0.16	0.01	0.01	0.18	0.08
UC	0.22	0.23	0.18	0.05	0.13	0.03	3.99	0.01	0.01	0.24	0.01
Hos	0.02	0.06	0.02	0.05	0.05	0.02	0.32	0.05	0.09	0.1	0.02
ED	0.15	0.21	0.13	0.25	0.04	0.01	0.17	0.01	0.04	0.2	0.06
IS	0.08	0.19	0.34	1.39	0.59	0.26	0.21	0.17	0.19	0.17	0.07
R	0.08	0.13	0.16	0.18	0.03	0.15	0.07	0.02	0.08	0.09	0.15
Lab	0.11	0.17	0.12	0.22	0.08	0.24	0.35	0.03	0.04	0.11	0.12
Tel	0.06	0.23	0.14	0.04	0.04	0.06	2.43	0.05	0.04	0.17	0.1
P	0.12	0.17	0.13	0.2	0.14	0.23	0.6	0.04	0.02	0.17	0.07

Table D.1.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 18 to 39, Chronic Condition 0, 2001-2004

	Next State (NS)										
Current State (CS)	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.01	0	0	0	0	0	0	0	0	0.01	0
PC	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0.01	0	0	0	0	0	0	0.01	0
UC	0	0	0	0	0	0	0	0	0	0	0
Hos	0	0	0	0	0.03	0	0.13	0	0	0.02	0
ED	0	0	0	0	0	0	0	0	0	0	0
IS	0.05	0	0.28	0.56	0.1	0.08	0.06	0.1	0.04	0	0
R	0	0	0.01	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0
Tel	0	0	0.01	0	0	0	0	0	0	0.01	0
P	0	0	0	0	0	0	0	0	0	0	0

Table D.2.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 18 to 39, Chronic Condition 0, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	12.62	99.38	29.97	69.63	40.6	26.4	300.57	18.02	21.68	28.77	50.35	45.88
PC	72.65	58.56	43.1	113.76	50.57	86.11	263.53	21.45	6.86	37.23	42.84	24.03
SC	58.62	118.07	17.5	86.83	17.84	61.03	278.29	10.74	9.88	26.34	38.7	35.86
UC	123.66	135.24	90.6	6.28	29.91	16.2	416.25	5.33	2.79	15.88	41.75	6.46
Hos	36.17	79.05	33.24	57.04	3.24	26.76	5.83	157.37	73.22	14.37	10.74	12.91
ED	98.14	122.71	79.94	143.11	14.77	2.91	219.19	1.94	22.26	51.45	56.75	21.8
IS	8.46	28.25	7.09	71	7.17	1.11	4.6	2.33	1.9	1	22.63	6.41
R	44.48	86.11	34.03	94.64	19.18	55.39	264.24	6.37	46.25	15.94	24.49	73.74
Lab	60.11	95.22	44.46	89	26.84	101.65	345.18	10.1	5.43	15.63	24.77	72.42
E	50.19	73.44	27.05	60.66	44.86	96.19	581.83	15.61	14.37	19.75	35.22	32.42
Tel	77.83	79.15	49.73	35.2	29.62	44.45	360.04	22.62	17.28	19.76	26.58	37.18
P	70.51	99.81	57.45	94.62	73.32	96.42	307.14	21.66	11.09	37.87	60.69	26.87

Table D.2.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 18 to 39, Chronic Condition 0, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.07	0.17	0.04	0.11	0.06	0.04	0.46	0.02	0.03	0.05	0.07	0.06
PC	0.11	0.11	0.06	0.21	0.07	0.15	0.34	0.03	0.01	0.07	0.06	0.03
SC	0.09	0.22	0.04	0.16	0.03	0.11	0.41	0.02	0.01	0.05	0.06	0.04
UC	0.16	0.23	0.12	0.01	0.05	0.02	0.36	0.01	0	0.02	0.06	0.01
Hos	0.05	0.13	0.05	0.08	0.01	0.05	0.2	0.25	0.15	0.02	0.02	0.01
ED	0.17	0.23	0.13	0.28	0.03	0.01	0.32	0	0.03	0.07	0.08	0.03
IS	0.27	0.15	0.02	.	0.43	0.4	0.02	0.53	0.49	0.5	0.03	0.01
R	0.08	0.17	0.07	0.2	0.04	0.12	0.35	0.01	0.08	0.03	0.04	0.1
Lab	0.1	0.18	0.08	0.18	0.06	0.19	0.55	0.02	0.01	0.03	0.05	0.1
E	0.07	0.12	0.04	0.11	0.06	0.14	1.49	0.02	0.02	0.08	0.06	0.04
Tel	0.11	0.14	0.08	0.07	0.05	0.08	0.47	0.03	0.02	0.04	0.06	0.05
P	0.1	0.17	0.09	0.17	0.1	0.17	0.39	0.03	0.01	0.08	0.1	0.05

Table D.2.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 18 to 39, Chronic Condition 0, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.01	0	0	0	0	0	0	0	0	0	0	0
PC	0	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
UC	0	0	0	0	0	0	0	0	0	0	0	0
Hos	0	0	0	0	0	0	0.03	0	0	0	0	0
ED	0	0	0	0	0	0	0	0	0	0	0	0
IS	0.03	0.01	0	.	0.06	0.36	0	0.23	0.26	0.5	0	0
R	0	0	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0
Tel	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0

Table D.3.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 18 to 39, Chronic Condition 1, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	6.67	88.41	6.92	65.96	7.67	25.66	3.24	4.47	12.44	10.32	35.67
PC	8.45	25.29	14.54	33.94	4.14	40.6	61.02	11.01	5.26	32.2	11.98
SC	18.89	135.23	7.95	105.26	4.79	55.06	11.8	8.03	10.37	12.86	40.69
UC	34.76	62.18	25.7	14.42	5	7.04	363	3.52	1.96	44.16	5.47
Hos	4.75	22.03	4.03	13	1.75	5.11	4	3.75	22.21	6.43	19.66
ED	32.78	56.8	40.01	72.95	7.8	2.36	1.5	10.53	14.51	42.41	20.89
IS	2.54	133.27	0.82	.	5	4.8	1.24	0	2.63	0.75	11.8
R	14.84	51.34	14.98	89.17	13.7	46.55	3	6.21	35.74	16.17	53.57
Lab	23.59	49.68	19.68	59.5	18.59	71.74	77.07	8.9	13.31	18	40.7
Tel	18.16	159.8	15.84	19.76	20.98	35.53	463	31.17	28.84	10	61.96
P	28.97	58.88	25.55	66.87	45.28	72.52	127.64	19.89	10.64	32.6	20.06

Table D.3.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 18 to 39, Chronic Condition 1, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.13	0.1	0.03	0.07	0.17	0.03	0.29	0	0.01	0.07	0.04
PC	0.02	0.07	0.04	0.08	0.01	0.09	0.08	0.02	0.01	0.08	0.02
SC	0.05	0.15	0.08	0.12	0.32	0.06	0.69	0.01	0.01	0.15	0.04
UC	0.08	0.12	0.15	0.04	0.52	0.02	.	0.01	0	0.2	0.01
Hos	0.13	0.04	0.05	0.05	0.87	0.06	0.28	1.34	0.69	0.05	0.02
ED	0.08	0.11	0.09	0.14	0.05	0.01	4.5	0.01	0.02	0.13	0.03
IS	0.09	0.16	0.12	.	.	0.2	0.29	.	0.58	0.61	0.19
R	0.06	0.08	0.27	0.12	0.02	0.08	1.53	0.01	0.05	0.09	0.07
Lab	0.06	0.1	0.11	0.12	0.05	0.14	0.09	0.02	0.03	0.07	0.07
Tel	0.04	0.17	0.09	0.02	0.05	0.04	0.33	0.03	0.03	0.16	0.06
P	0.07	0.1	0.08	0.12	0.07	0.13	0.12	0.03	0.02	0.12	0.04

Table D.3.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 18 to 39, Chronic Condition 1, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.02	0	0	0	0.02	0	0.09	0	0	0.01	0
PC	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0.01	0	0.07	0	0.06	0	0	0.01	0
UC	0	0	0.01	0	0.1	0	.	0	0	0	0
Hos	0.03	0	0.01	0	0.49	0.01	0.07	0.36	0.03	0.01	0
ED	0	0	0	0	0.01	0	3	0	0	0	0
IS	0.03	0	0.14	.	.	0.04	0.24	.	0.22	0.82	0.02
R	0	0	0.02	0	0	0	0.51	0	0	0.01	0
Lab	0	0	0.01	0	0	0	0	0	0	0	0
Tel	0	0	0.01	0	0	0	0	0	0	0.02	0
P	0	0	0	0	0	0	0	0	0	0	0

Table D.4.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 18 to 39, Chronic Condition 1, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	9.85	58.8	18.52	40.92	34.52	16.08	54.75	14.26	10.9	15.8	27.72	22.29
PC	35.2	34.81	20.95	66.13	31.79	43.77	57.6	11.45	5.17	19.91	21.61	11.86
SC	26	70.58	11.73	54.1	12.07	34.66	173.16	7.46	6.03	15.97	20.38	17.22
UC	66.75	85.09	54.69	3.73	48.25	8.11	.	8.99	1.86	9.18	24.17	3.7
Hos	31.18	49.96	18.74	5.35	3.3	23.1	0.14	36.67	144.97	4.32	6.1	8.46
ED	54.44	71.97	44.07	54.02	4.42	1.18	1	0.54	10.25	12.12	29.78	10.54
IS	4.33	3.28	2.5	.	.	3.5	2.08	2	0.5	0	1.11	5.23
R	28.59	53.52	20.64	54.39	7.95	34.58	229	2.82	31.52	9.83	14.72	39.69
Lab	30.05	59.66	24.82	52.03	20.2	62.76	1	5.18	2.75	9.61	15.26	39.06
E	29.41	51.28	19.55	35.86	24.2	67.21	708.43	14.29	10.75	12.51	22.47	18.76
Tel	45.31	58.17	35.8	23.13	24.52	29.33	52.15	15.69	10.56	12.13	17.87	22.79
P	37	66.15	34.82	61.82	36.19	62.72	458.68	15.51	8.14	26.21	38.54	16.68

Table D.4.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 18 to 39, Chronic Condition 1, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.07	0.1	0.03	0.08	0.06	0.03	0.26	0.02	0.01	0.03	0.04	0.03
PC	0.05	0.07	0.03	0.13	0.06	0.08	0.06	0.02	0.01	0.04	0.03	0.02
SC	0.04	0.12	0.03	0.1	0.02	0.05	0.2	0.01	0.01	0.03	0.04	0.03
UC	0.09	0.13	0.07	0.01	0.17	0.01	.	0.01	0	0.02	0.04	0
Hos	0.04	0.1	0.04	0.41	0.01	0.05	0.14	0.23	0.23	0.27	0.03	0.01
ED	0.11	0.12	0.06	0.12	0.02	0.01	.	0	0.02	0.03	0.04	0.01
IS	0.33	1.16	0.15	.	.	0.75	0.43	.	0.25	.	0.24	0.36
R	0.04	0.1	0.05	0.13	0.03	0.07	0.18	0.01	0.06	0.03	0.03	0.06
Lab	0.05	0.11	0.05	0.1	0.04	0.13	.	0.01	0.01	0.03	0.03	0.06
E	0.04	0.09	0.03	0.07	0.04	0.08	1.3	0.02	0.02	0.07	0.04	0.03
Tel	0.07	0.1	0.06	0.05	0.04	0.05	0.15	0.02	0.02	0.03	0.04	0.03
P	0.06	0.11	0.05	0.11	0.05	0.11	0.77	0.02	0.01	0.06	0.07	0.03

Table D.4.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 18 to 39, Chronic Condition 1, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.01	0	0	0	0	0	0	0	0	0	0	0
PC	0	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
UC	0	0	0	0	0	0	.	0	0	0	0	0
Hos	0	0	0	0.08	0	0	1	0.01	0	0.06	0	0
ED	0	0	0	0	0	0.01	.	0	0	0	0	0
IS	0.08	0.35	0.06	.	.	0.21	0.21	.	0.5	.	0.22	0.07
R	0	0	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	.	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0.01	0	0
Tel	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0

Table D.5.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 18 to 39, Chronic Condition 2, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	4.87	48.79	3.87	18.54	27.58	3.42	4.38	1.06	3.92	5.48	17.51
PC	6.35	15.82	9.81	16.23	3.84	16.51	12.39	7.88	3.74	20.82	7.94
SC	16.55	107.19	5.55	36.65	4.82	23.82	5.82	8.64	9.14	8.17	26.73
UC	27.89	45.88	44.61	9.9	7.43	2.4	1	0.69	1.81	19.12	3.02
Hos	9.64	14.58	3.37	13.31	2.28	5.3	4.14	62.27	141.64	10.88	6.46
ED	17.08	30.99	20.22	28.28	7.97	1.35	5.25	4.02	12.07	28.94	12.89
IS	1.89	31.27	1.13	123.88	2.8	32	6.4	0	3.65	0	14.16
R	14.88	33.51	12.24	22.72	10.53	35.26	31.2	2.45	28.53	9.16	34.85
Lab	13.83	29.62	15.76	38.52	17.87	39.7	25.78	5.88	7.42	12.11	23.69
Tel	15.35	126.52	10.28	16.53	31.84	25.21	1.67	22.01	22.68	6.79	36.1
P	17.57	36.81	18.3	42.33	21.51	42.97	25.32	15.04	7.09	22.19	11.51

Table D.5.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 18 to 39, Chronic Condition 2, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.08	0.05	0.03	0.03	0.03	0.01	0.41	0.02	0.01	0.09	0.02
PC	0.01	0.05	0.03	0.04	0.01	0.05	0.01	0.02	0.01	0.05	0.02
SC	0.03	0.11	0.11	0.04	0.34	0.03	0.52	0.01	0.01	0.13	0.03
UC	0.04	0.09	0.09	0.04	0.17	0.03	.	0.1	0	0.15	0
Hos	0.01	0.02	0.33	0.04	0.5	0.04	0.44	0.12	0.32	0.03	0.01
ED	0.07	0.06	0.06	0.11	0.03	0.01	0.42	0.01	0.02	0.08	0.02
IS	0.03	0.06	0.12	0.13	0.48	0.14	0.11	.	0.44	.	0.02
R	0.03	0.05	0.14	0.08	0.02	0.08	0.09	0	0.04	0.17	0.04
Lab	0.04	0.06	0.07	0.07	0.03	0.08	0.03	0.02	0.02	0.07	0.04
Tel	0.03	0.13	0.22	0.02	0.03	0.02	4.17	0.02	0.02	0.14	0.03
P	0.04	0.06	0.06	0.07	0.04	0.08	0.02	0.02	0.01	0.1	0.03

Table D.5.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 18 to 39, Chronic Condition 2, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.02	0	0.01	0	0	0	0.09	0.02	0	0.02	0
PC	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0.02	0	0.07	0	0.09	0	0	0.02	0
UC	0	0	0	0	0.02	0.01	.	0.14	0	0.01	0
Hos	0	0	0.1	0	0.22	0.01	0.11	0	0	0	0
ED	0	0	0	0	0	0	0.08	0	0	0	0
IS	0.02	0	0.11	0	0.17	0	0.02	.	0.12	.	0
R	0	0	0.01	0	0	0	0	0	0	0.02	0
Lab	0	0	0	0	0	0	0	0	0	0.01	0
Tel	0	0	0.02	0	0	0	2.5	0	0	0.02	0
P	0	0	0	0	0	0	0	0	0	0	0

Table D.6.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 18 to 39, Chronic Condition 2, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	7.2	37.72	10.63	22.54	4.63	9.46	3.71	4.84	9.52	7.95	15.28	13.58
PC	16.24	22.73	13	42.42	17.1	20.28	15.56	9.4	3.12	10.51	11.04	7.39
SC	20.51	44.35	8.03	25.93	9.4	19.48	111.5	4.5	4.58	9.38	11.65	10.56
UC	34.03	44.28	45.25	2.75	48.5	2.35	1	1.08	0.88	5.74	16.04	1.71
Hos	11.95	44.87	9.88	25.44	1.94	15.69	0.36	3.67	46.33	21.23	5.19	8.66
ED	28.8	39.77	18.76	51.42	11.31	0.78	6.67	0.51	7.16	11.23	16.23	6.02
IS	3.55	3.25	44.12	.	2	6.5	2.89	0	0.33	1	83.63	2.71
R	14.07	31.79	14.51	28.48	3.38	16.57	4.17	1.28	19.6	8.51	9.81	25.8
Lab	18.47	37.58	16.63	32.35	16.37	30.92	1.72	3.87	2.1	6.64	10.06	23.9
E	20.37	36.52	16.3	18.85	19.78	23.47	3	5.98	7.81	8.42	15.89	11.5
Tel	32.8	42.55	25.01	15.42	18.36	17.12	9.5	12.76	10.34	7.05	12.54	14.43
P	28.56	47.44	24.35	38.01	28.25	35.12	68.14	11	6.21	16.48	24.29	10

Table D.6.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 18 to 39, Chronic Condition 2, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.06	0.06	0.02	0.04	0.54	0.01	0.54	0.01	0.01	0.02	0.02	0.02
PC	0.04	0.05	0.02	0.07	0.07	0.04	0.14	0.02	0.01	0.02	0.02	0.01
SC	0.03	0.08	0.02	0.06	0.03	0.03	0.23	0.01	0.01	0.02	0.02	0.02
UC	0.04	0.06	0.06	0	0.11	0.01	.	0.01	0	0.02	0.03	0
Hos	0.02	0.08	0.04	0.08	0.44	0.03	0.09	0.63	0.13	0.02	0.07	0.01
ED	0.04	0.06	0.04	0.08	0.01	0	1.22	0	0.01	0.02	0.03	0.01
IS	0.3	3.39	0.04	.	2	0.5	0.08	.	0.15	.	0.06	0.43
R	0.03	0.06	0.03	0.06	0.09	0.04	1.94	0.01	0.04	0.02	0.02	0.04
Lab	0.03	0.07	0.03	0.07	0.03	0.06	1.97	0.01	0	0.02	0.03	0.04
E	0.03	0.06	0.03	0.04	0.05	0.04	3	0.01	0.01	0.04	0.03	0.02
Tel	0.05	0.07	0.04	0.03	0.03	0.03	0.39	0.02	0.02	0.02	0.03	0.02
P	0.04	0.08	0.04	0.07	0.04	0.06	0.08	0.01	0.01	0.05	0.04	0.02

Table D.6.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 18 to 39, Chronic Condition 2, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.01	0	0	0	0.12	0	0.15	0	0	0	0	0
PC	0	0	0	0	0	0	0.01	0	0	0	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
UC	0	0	0	0	0	0	.	0.01	0	0	0	0
Hos	0	0	0	0	0.23	0	0.25	0.17	0	0	0.01	0
ED	0	0	0	0	0	0.01	0.18	0	0	0	0	0
IS	0.08	1.04	0	.	1	0.08	0.03	.	0.44	.	0	0.16
R	0	0	0	0	0.03	0	0.46	0.01	0	0	0	0
Lab	0	0	0	0	0	0	1.15	0	0	0	0	0
E	0	0	0	0	0	0	1	0	0	0	0	0
Tel	0	0	0	0	0	0	0.04	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0

Table D.7.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 40 to 64, Chronic Condition 0, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	8.37	121.97	7.59	148.7	60.06	65.25	50.1	3.37	13.7	12.16	53.02
PC	13.2	34.51	27.12	49.93	12.7	61.07	32.15	15.93	7.36	40.54	18.07
SC	26.29	240.02	8.32	222.14	51.71	89.63	98.93	13.13	24.05	15.31	73.75
UC	49.65	81.92	54.03	13.2	101.06	10.34	4.75	11.57	6.24	58.88	7.75
Hos	4.43	30.49	4.18	9.75	4.35	5.04	2.54	10.34	76.11	5.2	14.56
ED	44.81	66.96	39.36	104.77	14.85	1.61	9.73	2.73	17.81	39.05	26.9
IS	1.64	95.44	7.12	475	4.26	4.15	2.68	4.72	11.82	0.25	37.1
R	24.85	93.47	24.63	160.74	30.88	145.77	77.09	10.85	54.59	21.69	77.74
Lab	30.39	70.01	34.67	106.75	32.95	130.73	45.35	14.68	14.57	22.01	52.18
Tel	23.33	179.33	17.59	36.54	64.21	55.27	148.09	31.69	30.05	10.21	72.32
P	32.45	81.57	29.21	115.59	76.92	142.93	97.22	24.64	15.92	34.03	24.22

Table D.7.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 40 to 64, Chronic Condition 0, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.08	0.14	0.03	0.17	0.07	0.07	0.04	0	0.01	0.08	0.05
PC	0.04	0.08	0.07	0.09	0.02	0.11	0.03	0.05	0.02	0.11	0.03
SC	0.06	0.29	0.09	0.25	0.07	0.1	0.08	0.02	0.02	0.17	0.07
UC	0.13	0.15	0.13	0.04	0.15	0.01	2.35	0.02	0.01	0.16	0.01
Hos	0.04	0.03	0.12	0.01	0.01	0.02	0.17	0.23	0.08	0.02	0.01
ED	0.08	0.11	0.12	0.19	0.04	0	0.14	0.01	0.02	0.12	0.03
IS	0.03	0.1	0.01	0.44	0.26	0.07	0.07	0.07	0.01	0.1	0.03
R	0.08	0.14	0.11	0.23	0.04	0.21	0.08	0.03	0.07	0.11	0.09
Lab	0.09	0.12	0.12	0.18	0.05	0.23	0.04	0.05	0.03	0.08	0.08
Tel	0.05	0.19	0.11	0.04	0.06	0.05	0.13	0.04	0.03	0.14	0.07
P	0.08	0.11	0.1	0.16	0.1	0.21	0.08	0.05	0.02	0.15	0.05

Table D.7.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 40 to 64, Chronic Condition 0, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.01	0	0	0	0	0	0	0	0	0.01	0
PC	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0.01	0	0	0	0	0	0	0.01	0
UC	0	0	0	0	0	0	0.5	0	0	0	0
Hos	0.01	0	0.03	0	0	0	0.07	0.02	0	0	0
ED	0	0	0	0	0	0	0.01	0	0	0	0
IS	0.02	0	0	0	0.06	0.02	0.03	0.01	0	0.41	0
R	0	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0
Tel	0	0	0.01	0	0	0	0	0	0	0.01	0
P	0	0	0	0	0	0	0	0	0	0	0

Table D.8.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 40 to 64, Chronic Condition 0, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	11.35	72.75	18.35	68.61	53.09	23.5	67.1	9.89	16.68	18.55	28.69	27.79
PC	44.06	44.57	24.8	112.68	96.49	74.62	33.09	14.51	7	27.11	32.88	18.05
SC	36.51	86.65	12.32	75.41	36.74	50.47	45.98	8.12	9.49	20.24	27.37	24.1
UC	59.6	86.4	51.05	2.47	53.03	5.64	115.47	4.93	1.87	9.47	26.08	3.98
Hos	7.84	87.37	17.3	14.76	3.6	12.25	0.89	106.07	41.99	8.41	5.87	6.56
ED	47.98	76.84	47.14	110.6	6.19	1.31	61.24	0.98	12.36	26.41	37.19	12.5
IS	12.63	14.71	2.61	33	31.82	6.16	2.41	17.26	18.99	1.68	5.58	6.73
R	31.6	73.76	29.54	105.92	15.1	66.09	50.21	6.81	37.3	18.59	24.77	47.31
Lab	38.52	63.88	30.76	82.97	26.9	116.64	47.33	8.03	4.92	11.06	19.33	42.74
E	32.58	57.06	19.36	47.82	49.47	93.16	193.49	13.54	10.16	15.29	26.99	22.35
Tel	41.55	61.01	35.42	27.42	39.33	30.81	23.21	18.41	12.33	14.53	21.33	25.46
P	41.35	69.71	37.42	93.25	56.12	103.65	65.84	18.33	11.28	29.76	47.01	16.66

Table D.8.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 40 to 64, Chronic Condition 0, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.07	0.12	0.03	0.09	0.07	0.03	0.08	0.02	0.02	0.04	0.04	0.04
PC	0.06	0.08	0.04	0.17	0.14	0.1	0.03	0.03	0.01	0.05	0.05	0.02
SC	0.06	0.15	0.03	0.12	0.06	0.07	0.05	0.02	0.01	0.04	0.04	0.03
UC	0.07	0.14	0.06	0.01	0.05	0.01	0.14	0.01	0	0.02	0.04	0
Hos	0.02	0.12	0.03	0.03	0	0.03	0.06	0.12	0.07	0.02	0.02	0.01
ED	0.07	0.13	0.08	0.18	0.02	0	0.05	0	0.02	0.04	0.05	0.01
IS	0.01	0.03	0.05	0.14	0.02	0.07	0.1	0.03	0.02	0.31	0.01	0.01
R	0.05	0.14	0.05	0.17	0.02	0.1	0.06	0.02	0.06	0.04	0.04	0.07
Lab	0.06	0.11	0.05	0.13	0.04	0.18	0.05	0.02	0.01	0.03	0.03	0.06
E	0.04	0.09	0.03	0.08	0.06	0.12	0.22	0.03	0.02	0.06	0.05	0.03
Tel	0.06	0.1	0.05	0.05	0.06	0.04	0.03	0.04	0.02	0.03	0.04	0.03
P	0.06	0.11	0.05	0.14	0.07	0.15	0.07	0.03	0.02	0.06	0.07	0.03

Table D.8.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 40 to 64, Chronic Condition 0, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.01	0	0	0	0	0	0	0	0	0	0	0
PC	0	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
UC	0	0	0	0	0	0	0	0	0	0	0	0
Hos	0	0	0	0	0	0	0.07	0	0	0	0	0
ED	0	0	0	0	0	0	0	0	0	0	0	0
IS	0	0	0.02	0	0	0.01	0.04	0	0	0.18	0	0
R	0	0	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0
Tel	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0

Table D.9.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 40 to 64, Chronic Condition 1, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	6.09	74.02	3.99	79.05	30.75	26.72	2.58	2.33	10.98	7.37	27.66
PC	6.38	18.61	12.72	26.21	4.19	25.53	12.05	9.32	4.91	19.77	10.59
SC	14.59	159.73	6.48	140.52	20.84	59.26	18.84	5.93	13.19	9.39	38.34
UC	15.92	41.56	25.71	7.59	93.56	5.65	3.8	5.09	2.96	35.58	4.02
Hos	5.13	14.79	4.91	6.32	1.38	4.47	3.05	9.41	63.42	6.18	8.69
ED	24.79	27.47	22.8	39.88	3.97	0.65	6.16	2.15	6.26	20.88	11.28
IS	1.79	77.82	1.45	111.2	2.7	41.32	1.94	1.05	2.94	0.97	14.09
R	15.5	53.07	15.05	91.14	14.12	79.17	1.83	6.5	31.45	12.56	40.06
Lab	17.22	36.84	18.07	53.87	18.77	82.15	26.58	8.15	10.24	11.27	28.77
Tel	13.06	133.37	12.72	28.97	38.55	28.81	3.91	30.02	21.92	7.57	42.35
P	20.03	50.69	17.25	74.86	41.37	98.43	30.83	16.77	11.71	21.06	15.51

Table D.9.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 40 to 64, Chronic Condition 1, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.07	0.08	0.04	0.08	0.05	0.03	0.55	0	0.01	0.07	0.03
PC	0.02	0.05	0.04	0.05	0.01	0.05	0.01	0.04	0.01	0.06	0.02
SC	0.05	0.17	0.11	0.15	0.03	0.06	0.02	0.01	0.01	0.14	0.04
UC	0.15	0.08	0.13	0.03	0.15	0.01	0.67	0.05	0	0.14	0.01
Hos	0.04	0.02	0.03	0.03	0.27	0.03	0.22	0.11	0.08	0.02	0.01
ED	0.04	0.05	0.04	0.08	0.09	0	0.57	0	0.01	0.07	0.02
IS	0.05	0.09	0.12	0.11	1.09	0.04	0.1	0.31	0.06	0.08	0.01
R	0.06	0.08	0.12	0.12	0.02	0.1	2.56	0.02	0.05	0.11	0.06
Lab	0.05	0.07	0.09	0.09	0.04	0.12	0.02	0.03	0.02	0.06	0.06
Tel	0.04	0.13	0.09	0.03	0.04	0.03	0.19	0.03	0.02	0.14	0.04
P	0.05	0.07	0.09	0.1	0.06	0.13	0.03	0.04	0.02	0.13	0.03

Table D.9.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 40 to 64, Chronic Condition 1, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.01	0	0.01	0	0	0	0.21	0	0	0.01	0
PC	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0.02	0	0	0	0	0	0	0.01	0
UC	0.01	0	0.01	0	0	0	0.18	0.01	0	0	0
Hos	0.01	0	0.01	0	0.2	0.01	0.07	0.01	0	0	0
ED	0	0	0	0	0.02	0	0.09	0	0	0	0
IS	0.03	0	0.08	0	0.4	0	0.05	0.3	0.02	0.08	0
R	0	0	0.01	0	0	0	1.4	0	0	0.01	0
Lab	0	0	0.01	0	0	0	0	0	0	0.01	0
Tel	0	0	0.01	0	0	0	0.05	0	0	0.02	0
P	0	0	0	0	0	0	0	0	0	0.01	0

Table D.10.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 40 to 64, Chronic Condition 1, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	7.94	42.8	9.69	32.61	26.54	11.89	21.94	5.55	9.01	11.33	13.69	16.25
PC	20.34	25.32	13.16	60.05	47.04	34.41	23.14	8.15	4.57	13.91	16.84	10.28
SC	19.51	49.83	8.13	43.47	21.63	25.4	10.59	5.16	5.77	11.57	15.37	14.19
UC	37.02	41.74	28.35	1.99	60.8	2.87	4.4	4.9	0.74	7.27	10.74	2.48
Hos	6.31	65.09	13.96	6.19	1.16	12.37	1.12	70.86	58.39	7.04	4.27	3.38
ED	23.59	43.25	25.41	27.21	5.49	0.54	35.27	0.58	4.58	16.51	15.57	6.43
IS	2	10.67	1.51	142.8	2.36	0.67	1.87	37.92	0.87	1.81	4.65	7.33
R	19.22	42.48	17.43	55.41	8.72	34.61	2.46	3.36	25.08	10.48	15.3	27.97
Lab	19.67	37.7	17.23	42.63	13.88	61.39	12.43	4.36	2.81	7.19	11.57	26.16
E	20.93	37.34	13.44	33.26	31.01	58.18	89.45	9.04	7.22	9.51	17.49	14.11
Tel	23.83	40.57	23.19	16.08	22.84	17.63	9.67	12.16	7.88	8.92	12.53	15.78
P	27.15	48.46	24.98	70.39	39.94	75.12	40.46	13.11	8.62	21.45	31.13	11.4

Table D.10.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 40 to 64, Chronic Condition 1, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.06	0.07	0.02	0.05	0.03	0.02	0.05	0.01	0.01	0.02	0.02	0.02
PC	0.03	0.05	0.02	0.09	0.07	0.05	0.02	0.02	0.01	0.03	0.02	0.02
SC	0.03	0.08	0.02	0.06	0.03	0.03	0.02	0.01	0.01	0.03	0.02	0.02
UC	0.05	0.06	0.04	0	0.05	0	0.87	0.01	0	0.01	0.02	0
Hos	0.02	0.09	0.02	0.09	0.2	0.06	0.06	0.13	0.06	0.02	0.04	0.01
ED	0.03	0.07	0.04	0.08	0.04	0	0.07	0	0.01	0.03	0.03	0.01
IS	0.44	0.02	0.05	0.2	0.84	0.13	0.29	0.04	0.18	0.27	0.01	0.01
R	0.03	0.08	0.03	0.08	0.02	0.05	0.58	0.01	0.04	0.03	0.03	0.05
Lab	0.03	0.06	0.03	0.06	0.02	0.09	0.01	0.01	0.01	0.02	0.02	0.05
E	0.03	0.06	0.02	0.05	0.04	0.07	0.08	0.02	0.02	0.04	0.03	0.02
Tel	0.03	0.06	0.04	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.02
P	0.04	0.07	0.04	0.1	0.05	0.1	0.04	0.02	0.01	0.05	0.05	0.03

Table D.10.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 40 to 64, Chronic Condition 1, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.01	0	0	0	0	0	0	0	0	0	0	0
PC	0	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
UC	0	0	0	0	0	0	0.2	0	0	0	0	0
Hos	0	0	0	0.02	0.17	0	0.05	0	0	0	0.01	0
ED	0	0	0	0	0.01	0.01	0	0	0	0	0	0
IS	0.22	0	0.03	0	0.36	0.19	0.15	0	0.2	0.15	0	0
R	0	0	0	0	0	0	0.23	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0
Tel	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0

Table D.11.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 40 to 64, Chronic Condition 2, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	4.14	41.27	2.64	33.15	15.1	17.36	3.41	1.92	5.12	3.95	13.97
PC	2.99	10.64	5.9	9.97	1.62	10.46	2.35	5.67	3.44	8.77	6.52
SC	9.21	105.13	4.42	71.66	12.49	22.64	17.46	3.55	9.28	5.2	22.31
UC	6.74	21.05	15.22	3.46	5.63	1.96	6.2	4.95	1.6	11.16	2.37
Hos	3.4	14.64	4.5	9.25	1.88	4.07	2.25	29.59	26.01	5.27	8.8
ED	5.53	17.34	12.21	34.13	5.28	0.81	4.88	0.63	2.43	17.99	8.37
IS	1.32	24.97	1.9	73.58	3.71	1.69	3.54	2.55	5.68	4.11	11.21
R	9.35	30.23	9.18	54.23	3.54	36.94	9.59	3.83	19.08	7.65	24.26
Lab	8.22	20.53	10.95	32.98	12.14	35.74	3.98	4.57	5.78	6.01	17.98
Tel	8.79	105.73	8.78	17.59	14.99	26.74	23.62	13.18	12.01	5.02	28.62
P	12.48	31.68	11.5	46.19	19.97	52.82	15.34	11.5	7.21	14.01	8.84

Table D.11.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 40 to 64, Chronic Condition 2, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.08	0.05	0.02	0.04	0.02	0.02	0.39	0	0.01	0.04	0.02
PC	0.02	0.03	0.02	0.02	0.01	0.02	0.1	0.02	0.01	0.03	0.02
SC	0.03	0.1	0.05	0.07	0.02	0.02	0.01	0	0.01	0.11	0.02
UC	0.29	0.04	0.05	0.01	0.11	0	0.57	0.01	0	0.13	0
Hos	0.35	0.02	0.08	0.02	0.18	0.23	0.22	0.04	0.02	0.02	0.01
ED	0.06	0.03	0.03	0.04	0.01	0	0.59	0.01	0.01	0.05	0.02
IS	0.03	0.03	0.01	0.06	0.68	0.06	0.08	0.03	0.01	0.01	0.01
R	0.03	0.04	0.12	0.06	0.12	0.05	0.01	0.01	0.03	0.1	0.04
Lab	0.04	0.04	0.06	0.04	0.02	0.05	0.55	0.01	0.02	0.05	0.04
Tel	0.03	0.1	0.07	0.02	0.02	0.02	0.02	0.01	0.01	0.13	0.03
P	0.03	0.04	0.09	0.06	0.03	0.07	0.02	0.02	0.01	0.09	0.02

Table D.11.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 40 to 64, Chronic Condition 2, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.02	0	0.01	0	0	0	0.11	0	0	0.01	0
PC	0.01	0	0	0	0	0	0.04	0	0	0	0
SC	0	0	0.01	0	0	0	0	0	0	0.02	0
UC	0.04	0	0	0	0.02	0	0.09	0	0	0.01	0
Hos	0.1	0	0.02	0	0.09	0.06	0.1	0	0	0	0
ED	0.01	0	0	0	0	0	0.12	0.01	0	0	0
IS	0.02	0	0	0	0.18	0.04	0.02	0.01	0	0	0
R	0	0	0.01	0	0.03	0	0	0	0	0.01	0
Lab	0	0	0.01	0	0	0	0.14	0	0	0.01	0
Tel	0	0	0.01	0	0	0	0	0	0	0.03	0
P	0	0	0.01	0	0	0	0	0	0	0.01	0

Table D.12.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 40 to 64, Chronic Condition 2, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	5.2	32	6.22	22.57	15.36	7.81	13.72	4.24	4.42	7.18	7.15	10.13
PC	12.94	15.99	7.48	37.15	21.55	19.41	3.21	5.89	3.43	8.02	9.33	6.54
SC	14.64	32.24	5.59	23.8	12.49	12.82	5.77	2.54	3.63	6.92	8.58	9.14
UC	13.07	32.36	13.23	0.86	11.55	1.49	6.33	2.94	0.41	3.92	8.63	1.16
Hos	5.17	91.82	12.32	9.54	2.81	7.58	1	60.65	32.45	8.17	5.75	5.55
ED	7.57	29.16	16.16	24.28	5.33	0.42	3.74	0.49	1.97	9.53	11.42	5.22
IS	1.4	8.08	2.49	0.4	2.66	0.85	1.76	1.28	9.77	1	0.99	4.77
R	9.75	26.03	10.91	32.92	6.57	31.28	14.57	2	16.51	6.97	9.02	17.8
Lab	11.51	24.69	11.68	30.3	7.02	52.2	11.05	2.85	1.71	5.03	7.33	17.66
E	17.44	27.96	10.95	17.5	14	36.27	17.37	5.96	5.5	6.36	12.17	10.13
Tel	18.41	31.28	18.37	11.08	16.15	13.41	11.51	8.41	5.9	6.08	9.32	11.37
P	20.03	37.43	18.61	50.24	21.59	55.72	26.51	9	6.56	15.43	21.61	7.67

Table D.12.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 40 to 64, Chronic Condition 2, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.05	0.05	0.01	0.03	0.03	0.01	0.01	0.01	0.01	0.02	0.01	0.02
PC	0.02	0.03	0.01	0.05	0.03	0.03	0.01	0.01	0.01	0.02	0.01	0.01
SC	0.02	0.05	0.02	0.03	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.02
UC	0.02	0.04	0.02	0	0.02	0	1.32	0	0	0.03	0.02	0
Hos	0.03	0.11	0.03	0.03	0.02	0.07	0.09	0.16	0.07	0.01	0.02	0.01
ED	0.02	0.05	0.03	0.07	0.01	0	0.65	0	0	0.02	0.02	0.01
IS	0.26	0.01	0	0.2	0.44	0.33	0.49	0.3	0.01	0.54	0.11	0.01
R	0.02	0.05	0.03	0.05	0.01	0.04	0.01	0.01	0.03	0.02	0.02	0.04
Lab	0.02	0.04	0.02	0.04	0.02	0.06	0.02	0.01	0	0.02	0.02	0.04
E	0.02	0.04	0.02	0.03	0.03	0.04	0.04	0.01	0.02	0.03	0.03	0.02
Tel	0.02	0.05	0.03	0.02	0.03	0.02	0.02	0.02	0.01	0.01	0.02	0.02
P	0.03	0.05	0.03	0.07	0.03	0.07	0.03	0.01	0.01	0.04	0.03	0.02

Table D.12.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 40 to 64, Chronic Condition 2, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.01	0	0	0	0	0	0	0	0	0	0	0
PC	0	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
UC	0	0	0	0.01	0	0	0.21	0	0	0.01	0	0
Hos	0	0	0	0	0.01	0.01	0.09	0	0	0	0	0
ED	0	0	0	0	0	0	0.17	0	0	0	0	0
IS	0.18	0	0	0.5	0.16	0.39	0.28	0.24	0	0.54	0.11	0
R	0	0	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0.01	0	0
Tel	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0

Table D.13.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 65 and up, Chronic Condition 0, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	5	72.75	4.85	71.71	14.04	20.69	6.33	3.28	10.81	3.7	29.82
PC	7.19	25.3	18.72	33.73	6.46	20.39	3.33	11.65	7.16	17.77	14.56
SC	16.68	171.08	7.14	194.06	23.12	37.96	9.06	7.71	18.14	9.81	52.84
UC	16.53	34.44	25.01	5.05	74.85	7.43	3	5.27	2.78	14.33	5.09
Hos	6.72	32.55	4.38	18.84	6.54	4.81	1.4	11.51	53.84	3.64	32.4
ED	16.77	27.95	23.99	70.79	11.89	0.82	4.71	0.91	2.78	12.85	20.71
IS	2.19	66.87	2.64	193.23	10.38	26.85	4.06	1.7	9.14	3.37	22.37
R	15.01	58.21	16.32	137.13	9.87	90.97	9.27	7.18	35.96	11.01	50.02
Lab	18.19	39.69	20.73	85.48	18.35	55.77	5.17	7.9	10.88	7.42	30.94
Tel	8.63	132.69	11.62	32.1	33.41	26.61	2.73	24.79	16.84	6.87	47.42
P	17.54	58.9	17.63	123.84	37.41	93.87	8.26	18.99	10.81	18.02	17.53

Table D.13.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 65 and up, Chronic Condition 0, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.05	0.09	0.03	0.08	0.08	0.02	0.01	0	0.01	0.04	0.03
PC	0.03	0.06	0.06	0.04	0.01	0.04	0.01	0.05	0.02	0.06	0.02
SC	0.06	0.19	0.06	0.21	0.04	0.04	0.01	0.01	0.02	0.13	0.05
UC	0.07	0.06	0.07	0.02	0.3	0.01	1.45	0.03	0.01	0.2	0.01
Hos	0.03	0.04	0.08	0.02	0.02	0.02	0.11	0.35	0.06	1.08	0.03
ED	0.06	0.05	0.04	0.15	0.02	0	0.32	0.01	0.02	0.11	0.02
IS	0.02	0.07	0.01	0.28	0.09	0.03	0.05	0.03	0.01	0.01	0.02
R	0.04	0.09	0.13	0.16	0.04	0.13	0.01	0.02	0.05	0.11	0.06
Lab	0.05	0.07	0.15	0.1	0.05	0.09	0.22	0.03	0.04	0.06	0.05
Tel	0.03	0.13	0.14	0.03	0.04	0.03	0.96	0.02	0.02	0.14	0.04
P	0.04	0.08	0.12	0.14	0.07	0.12	0.01	0.04	0.02	0.16	0.03

Table D.13.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 65 and up, Chronic Condition 0, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.01	0	0.01	0	0.01	0	0	0	0	0.01	0
PC	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0.01	0	0	0	0	0	0	0.01	0
UC	0	0	0	0	0	0	0.48	0.01	0	0.01	0
Hos	0	0	0.02	0	0	0	0.08	0.03	0	0.3	0
ED	0	0	0	0	0	0	0.07	0.01	0.01	0.01	0
IS	0.01	0	0	0	0.01	0	0.01	0.02	0	0	0
R	0	0	0.01	0	0	0	0	0	0	0.01	0
Lab	0	0	0.01	0	0	0	0.04	0	0	0.01	0
Tel	0	0	0.01	0	0	0	0.35	0	0	0.02	0
P	0	0	0.01	0	0	0	0	0	0	0.01	0

Table D.14.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 65 and up, Chronic Condition 0, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	5.03	45.86	9.41	38	20.29	11.29	13.94	4.6	5.95	13.46	8.27	16.3
PC	25.36	33.8	14.9	71.03	36.96	49.81	3.86	9.59	5.21	18.83	18.76	15.21
SC	29	53.12	8.44	49.41	24.46	26.77	9.28	5.6	6.8	13.61	14.89	17.4
UC	18.38	35.33	20.68	1.21	3.85	3.04	4.61	5.26	0.15	6.09	11.94	2.37
Hos	11.56	122.94	21.78	27.66	7.13	15.07	0.56	28.85	66.89	4.35	6.33	15.82
ED	15	33.05	23.53	30.56	8.39	0.55	5.39	0.36	4.95	48.98	15.08	11.05
IS	10.34	26.49	7.42	73.52	9.84	29.04	2.93	9.35	4.73	28.37	8.04	11.37
R	12.58	39.08	15.42	61.43	5.07	33.84	10.22	2.61	19.26	10.54	13.1	30.98
Lab	17.44	34.62	16.59	49.87	14.19	93.36	9.31	4.12	3.93	7.05	10.57	26.44
E	21.94	33.71	12.92	27.84	29.69	60.74	11.66	8.05	6.31	9.54	18.32	17.73
Tel	17.25	36	24.85	16.25	14.53	15.64	6.71	9.81	7.53	10.61	12.23	18.17
P	27.4	51.46	29.3	95.15	30.3	101.13	14.58	14.66	8.6	24.68	31.46	12.66

Table D.14.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 65 and up, Chronic Condition 0, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.02	0.06	0.01	0.04	0.03	0.01	0.03	0.01	0.01	0.02	0.01	0.02
PC	0.03	0.06	0.02	0.09	0.06	0.06	0.01	0.02	0.01	0.03	0.02	0.02
SC	0.04	0.08	0.02	0.06	0.04	0.03	0.07	0.01	0.01	0.02	0.02	0.02
UC	0.02	0.05	0.03	0	0.06	0	1.61	0.01	0	0.01	0.02	0
Hos	0.02	0.15	0.03	0.03	0.01	0.02	0.05	0.12	0.08	0.05	0.02	0.02
ED	0.02	0.05	0.03	0.14	0.01	0	0.15	0	0.01	0.05	0.02	0.01
IS	0.01	0.03	0.01	0.16	0.03	0.04	0.08	0.01	0.01	0.03	0.01	0.01
R	0.02	0.06	0.03	0.07	0.01	0.04	0.04	0.01	0.03	0.02	0.02	0.05
Lab	0.02	0.05	0.03	0.05	0.02	0.1	0.01	0.01	0.01	0.01	0.02	0.04
E	0.03	0.05	0.02	0.03	0.03	0.06	0.01	0.01	0.02	0.03	0.03	0.02
Tel	0.02	0.05	0.03	0.02	0.03	0.02	0.01	0.02	0.01	0.02	0.02	0.02
P	0.03	0.07	0.04	0.11	0.04	0.12	0.03	0.02	0.02	0.04	0.04	0.02

Table D.14.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 65 and up, Chronic Condition 0, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0	0	0	0	0	0	0	0	0	0	0	0
PC	0	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0	0	0	0	0.01	0	0	0	0	0
UC	0	0	0	0	0.02	0	0.35	0	0.03	0	0	0
Hos	0	0	0	0	0	0	0.09	0	0	0.01	0	0
ED	0	0	0	0	0	0	0.03	0	0	0	0	0
IS	0	0	0	0	0	0	0.03	0	0	0	0	0
R	0	0	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0
Tel	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0

Table D.15.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 65 and up, Chronic Condition 1, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	4.53	53.28	3.39	60.68	8.04	14.64	5.63	2.44	6.34	2.5	22.16
PC	4.96	16.84	11.13	17.84	3.52	13.68	3.69	7.55	5.32	10.19	10.17
SC	13.8	130.55	6.29	124.25	9.68	35.72	6.93	6.6	14.48	6.98	37.98
UC	5.78	20.83	12.89	2.35	7.65	3.28	75.91	7.8	2.27	19.14	2.77
Hos	4.29	20.46	3.69	6.31	2.75	4.23	2.74	36.05	43.45	5.06	27.13
ED	6.59	18.65	14.59	47.07	5.48	0.56	4.05	0.93	4.69	14.43	11.83
IS	2.24	38.47	3.08	184.93	20.23	22.78	2.93	1.89	7.82	2.34	26.24
R	10.07	39.32	12.13	105.1	4.24	42.19	2.48	4.61	25.56	7.52	34.83
Lab	10.6	27.9	14.74	55.72	15.04	35.22	8.87	5.71	8.94	5.18	22.51
Tel	9.4	102.85	10.18	19.3	9.25	22.02	17.39	17.65	14.2	4.98	33.35
P	12.7	41.68	14.02	82.56	27.45	66.26	8.01	14.43	8.75	13.24	12.66

Table D.15.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 65 and up, Chronic Condition 1, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.05	0.06	0.04	0.06	0.29	0.02	0.01	0	0.01	0.04	0.02
PC	0.02	0.05	0.06	0.03	0.01	0.03	0.01	0.04	0.02	0.05	0.02
SC	0.04	0.13	0.07	0.12	0.17	0.03	0.01	0.01	0.01	0.13	0.04
UC	0.63	0.05	0.2	0.06	0.55	0	0.1	0.01	0	0.1	0.01
Hos	0.12	0.03	0.51	0.02	0.09	0.04	0.01	0.07	0.04	0.03	0.02
ED	0.16	0.03	0.05	0.09	0.06	0	0.96	0	0.01	0.06	0.02
IS	0.01	0.04	0.01	0.23	0.03	0.03	0.1	0.07	0.01	0.01	0.03
R	0.04	0.06	0.15	0.12	0.12	0.05	0.88	0.01	0.04	0.12	0.05
Lab	0.05	0.05	0.09	0.06	0.02	0.06	0.01	0.02	0.03	0.05	0.04
Tel	0.02	0.1	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.14	0.03
P	0.04	0.05	0.12	0.09	0.05	0.08	0.02	0.03	0.02	0.21	0.02

Table D.15.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 65 and up, Chronic Condition 1, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.01	0	0.01	0	0.04	0	0	0	0	0.02	0
PC	0	0	0.01	0	0	0	0	0	0	0	0
SC	0	0	0.01	0	0.02	0	0	0	0	0.02	0
UC	0.11	0	0.02	0.02	0.07	0	0	0	0	0.01	0
Hos	0.03	0	0.14	0	0.03	0.01	0	0	0	0.01	0
ED	0.02	0	0	0	0.01	0	0.24	0	0	0	0
IS	0.01	0	0	0	0	0	0.03	0.04	0	0.01	0
R	0	0	0.01	0	0.03	0	0.35	0	0	0.02	0
Lab	0	0	0.01	0	0	0	0	0	0	0.01	0
Tel	0	0	0.01	0	0	0	0	0	0	0.03	0
P	0	0	0.01	0	0	0	0	0	0	0.02	0

Table D.16.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 65 and up, Chronic Condition 1, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	3.54	32.32	7.1	27.13	9.97	6.02	5.56	5.21	5.27	7.87	4.53	10.17
PC	11.43	20.34	8.85	36.58	27.44	23.15	2.41	6.72	3.4	10.04	9.89	9.81
SC	18.25	34.25	6.59	26.59	16.85	11.41	5.63	4.17	4.22	9.57	9.97	12.18
UC	17.28	18.71	15.98	0.89	1.71	0.68	25.26	1.34	0.88	3.91	6.05	1.56
Hos	14.77	94.45	31.97	8.76	11.83	5.52	0.58	292.33	75.12	15.59	7.2	16.06
ED	11.44	24.72	21.99	93.86	7.58	0.15	9.09	0.33	2.37	25.77	11.03	5.79
IS	4.74	15.57	5.3	223.42	6.01	3.13	2.16	6.27	4.39	13.49	5.27	6.26
R	8.17	25.8	11.19	31.46	4.33	17.64	8.12	1.79	12.57	8.73	8.49	21.47
Lab	8.85	23.94	12.61	30.27	9.64	39.59	5.52	2.3	3.2	5.51	7.76	19.57
E	14.43	25.03	10.94	24.27	11.64	42.2	16.95	6.33	5.97	7.35	12.76	13.06
Tel	11.03	26.23	18.73	9.78	12.85	11.55	4.16	8.77	5.62	8.04	8.03	12.88
P	16.79	36.25	21.14	67.61	23.04	73.09	8.89	10.5	6.62	19.33	21.38	8.9

Table D.16.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 65 and up, Chronic Condition 1, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.03	0.04	0.01	0.03	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02
PC	0.01	0.04	0.01	0.05	0.04	0.03	0.01	0.01	0.01	0.02	0.01	0.02
SC	0.02	0.05	0.02	0.03	0.03	0.01	0.02	0.01	0.01	0.02	0.01	0.02
UC	0.02	0.03	0.02	0	0.57	0	0.02	0.01	0	0.02	0.02	0
Hos	0.02	0.12	0.04	0.03	0.02	0.09	0.03	0.4	0.12	0.02	0.01	0.02
ED	0.02	0.03	0.03	0.11	0.01	0	0.01	0	0.01	0.03	0.01	0.01
IS	0.01	0.02	0.01	0.29	0.04	0.05	0.13	0.02	0.01	0.01	0.01	0.01
R	0.01	0.04	0.02	0.04	0.01	0.02	0.02	0	0.03	0.02	0.02	0.03
Lab	0.01	0.04	0.02	0.03	0.02	0.05	0.01	0.01	0.01	0.01	0.02	0.03
E	0.02	0.03	0.02	0.03	0.02	0.04	0.01	0.01	0.01	0.03	0.02	0.02
Tel	0.01	0.04	0.03	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.02	0.02
P	0.02	0.05	0.03	0.08	0.03	0.08	0.02	0.02	0.01	0.03	0.03	0.02

Table D.16.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 65 and up, Chronic Condition 1, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.01	0	0	0	0	0	0	0	0	0	0	0
PC	0	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
UC	0	0	0	0	0.34	0.01	0	0.01	0	0	0	0
Hos	0	0	0	0	0	0.02	0.06	0	0	0	0	0
ED	0	0	0	0	0	0.02	0	0	0	0	0	0
IS	0	0	0	0	0.01	0.01	0.06	0	0	0	0	0
R	0	0	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0
Tel	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0

Table D.17.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 65 and up, Chronic Condition 2, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	3.67	32.42	2.47	26.39	8.91	9.08	4.31	1.91	4.62	2.01	13.08
PC	3.27	9.49	5.9	8.12	1.09	6.09	1.73	4.95	3.22	5.77	6.3
SC	9.98	90.9	4.27	71.85	16.28	13.63	3.37	4.46	7.08	4.14	21.55
UC	6.05	13.17	17.61	1.07	19.82	0.27	4.35	1.56	0.62	8.51	2.19
Hos	3.91	27.29	3.53	12.59	3.31	3.8	1.42	6.54	56.22	3.74	21.37
ED	10.83	13.12	8.62	37.19	2.88	0.25	3.95	0.53	2.59	29.45	10.19
IS	2.6	41.57	1.46	118.72	11.4	13.54	2.76	5.88	4.77	2.86	15.43
R	6.21	25.72	8.26	60.99	4.65	40.73	4.28	2.77	14.48	5.37	22.53
Lab	6.78	17.41	9.21	27.4	6.47	22.76	4.62	3.6	5.84	3.32	14.7
Tel	6.2	84.59	7.4	23.12	8.88	12.34	7.1	11.88	9.84	3.97	25.36
P	8.64	26.04	10.09	51.05	14.67	38.76	5.46	9.33	5.31	9.65	7.09

Table D.17.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 65 and up, Chronic Condition 2, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.06	0.04	0.02	0.03	0.02	0.01	0.01	0	0.01	0.01	0.02
PC	0.01	0.03	0.04	0.01	0	0.01	0.07	0.02	0.01	0.02	0.02
SC	0.02	0.09	0.08	0.06	0.02	0.01	0.01	0	0.01	0.11	0.02
UC	0.08	0.02	0.03	0.02	0.08	0.01	0.16	0.02	0	0.07	0
Hos	0.11	0.03	0.26	0.02	0.07	0.2	0.12	0.09	0.05	0.43	0.02
ED	0.02	0.02	0.02	0.08	0.02	0	0.95	0	0	0.04	0.01
IS	0	0.05	0.01	0.14	0.01	0.02	0.07	0.01	0.01	0.01	0.02
R	0.05	0.04	0.13	0.06	0.01	0.05	0.01	0.01	0.03	0.15	0.03
Lab	0.03	0.03	0.1	0.03	0.04	0.03	0.02	0.01	0.03	0.07	0.03
Tel	0.01	0.08	0.1	0.02	0.01	0.01	0.01	0.01	0.02	0.15	0.02
P	0.03	0.03	0.1	0.05	0.03	0.05	0.01	0.02	0.01	0.11	0.01

Table D.17.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 65 and up, Chronic Condition 2, 2001-2004

	NS										
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	Tel	P
NA	0.02	0	0.01	0	0	0	0	0	0	0.01	0
PC	0	0	0.01	0	0	0	0.04	0	0	0	0
SC	0	0	0.02	0	0	0	0	0	0	0.03	0
UC	0.01	0	0	0.02	0	0.03	0.04	0.01	0	0.01	0
Hos	0.03	0	0.07	0	0.02	0.05	0.08	0.01	0	0.11	0
ED	0	0	0	0	0.01	0	0.24	0	0	0	0
IS	0	0	0.01	0	0	0	0.02	0	0	0	0
R	0.01	0	0.02	0	0	0	0	0	0	0.03	0
Lab	0	0	0.01	0	0.01	0	0	0	0.01	0.02	0
Tel	0	0	0.01	0	0	0	0	0	0	0.04	0
P	0	0	0.01	0	0	0	0	0	0	0.01	0

Table D.18.i: Mean Transition Time (Number of Days) of Patient Visit Encounters in Group 65 and up, Chronic Condition 2, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	2.75	26.33	6.19	20.12	6.39	5.58	5.43	5.16	3.21	7.37	3.47	8.24
PC	7.56	13.2	5.66	22.46	12.95	11.82	1.96	3.71	2.52	6.52	5.94	6.66
SC	11.43	24.86	4.78	13.32	9.73	7.78	3.94	2.06	3.25	6.45	6.04	8.63
UC	8.7	10.3	9.88	0.44	2.47	0.12	4.52	0.61	0.13	5.98	5.29	1.22
Hos	9.26	99.12	27.28	15.12	7.26	9.94	0.63	35.63	129.53	17.53	6.49	14.98
ED	5.45	20.26	9.62	31.94	2.45	0.23	3.6	0.13	2.84	26.71	6.82	5.25
IS	3.97	14.46	3.07	30.48	4.2	10.24	2.06	7.5	1.6	19.92	4.55	5.29
R	5.03	17.01	7.8	19.77	2.14	16.91	4.44	1.2	10.17	6.03	5.48	15.57
Lab	6.56	18.16	9.5	19.58	6.76	35.67	3.28	1.84	2.56	4.04	6.09	14.57
E	11.3	21.46	9.06	14.9	11.18	16.53	5.09	4.77	4.56	5.62	9.79	9.52
Tel	7.85	22.3	15.83	8.14	8.98	8.12	4.13	7.64	5.08	6.39	6.38	10.11
P	11.39	27.14	16.34	45.18	15.52	52.27	5.51	7.83	4.83	14.8	14.88	5.97

Table D.18.ii: Shape Parameter (Alpha) of the Gamma Distribution in Group 65 and up, Chronic Condition 2, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.02	0.03	0.01	0.02	0.01	0.01	0.02	0.01	0	0.01	0	0.01
PC	0.01	0.02	0.01	0.03	0.03	0.02	0.01	0.01	0	0.01	0.01	0.01
SC	0.02	0.04	0.01	0.02	0.02	0.01	0.05	0	0.01	0.01	0.01	0.02
UC	0.01	0.02	0.01	0	0.24	0.01	1.9	0.01	0	0.01	0.01	0
Hos	0.02	0.13	0.04	0.02	0.01	0.02	0.07	0.32	0.15	0.03	0.01	0.02
ED	0.01	0.03	0.01	0.03	0.06	0	0.2	0	0	0.03	0.01	0.01
IS	0.01	0.02	0.01	0.03	0.03	0.01	0.13	0.01	0.01	0.02	0.01	0.01
R	0.01	0.03	0.02	0.02	0.14	0.02	0.01	0	0.02	0.02	0.02	0.03
Lab	0.01	0.03	0.02	0.02	0.01	0.04	0.01	0	0.01	0.01	0.01	0.02
E	0.01	0.03	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.01
Tel	0.01	0.03	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01
P	0.01	0.04	0.02	0.05	0.02	0.06	0.01	0.01	0.01	0.03	0.02	0.01

Table D.18.iii: Rate Parameter (Beta) of the Gamma Distribution in Group 65 and up, Chronic Condition 2, 2009-2012

	NS											
CS	NA	PC	SC	UC	Hos	ED	IS	R	Lab	E	Tel	P
NA	0.01	0	0	0	0	0	0	0	0	0	0	0
PC	0	0	0	0	0	0	0	0	0	0	0	0
SC	0	0	0	0	0	0	0.01	0	0	0	0	0
UC	0	0	0	0	0.1	0.11	0.42	0.01	0.01	0	0	0
Hos	0	0	0	0	0	0	0.1	0.01	0	0	0	0
ED	0	0	0	0	0.03	0	0.06	0	0	0	0	0
IS	0	0	0	0	0.01	0	0.06	0	0.01	0	0	0
R	0	0	0	0	0.07	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0
Tel	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0

Appendix E

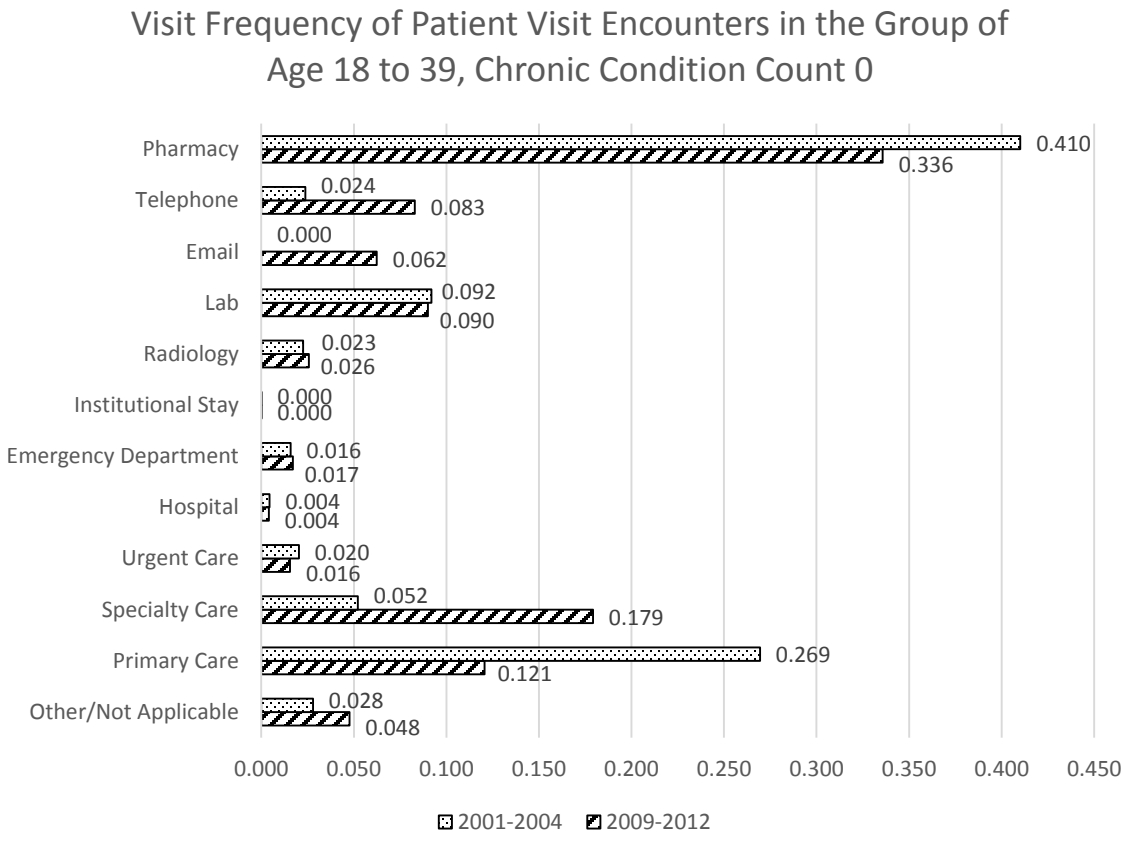

Figure E.1: Visit Frequency of Patient Visit Encounters in the Group of Age 18 to 39, Chronic Condition Count 0

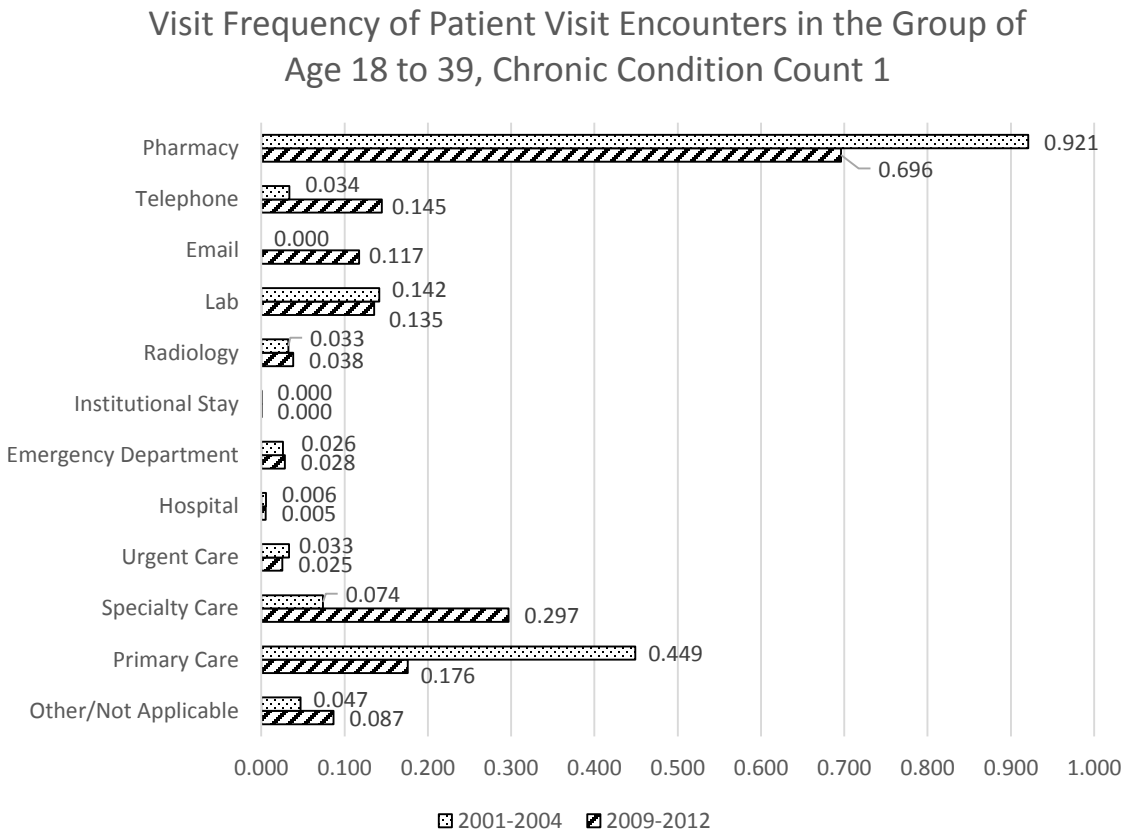

Figure E.2: Visit Frequency of Patient Visit Encounters in the Group of Age 18 to 39, Chronic Condition Count 1

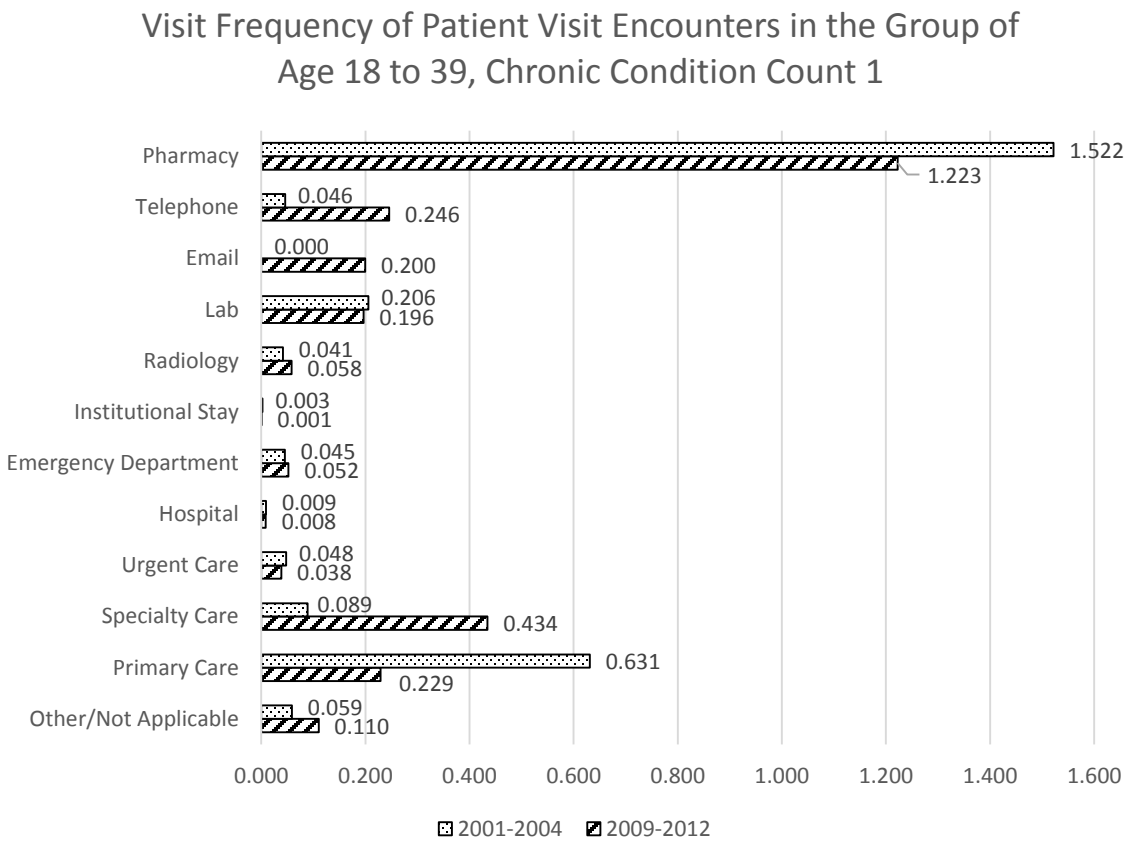

Figure E.3: Visit Frequency of Patient Visit Encounters in the Group of Age 18 to 39, Chronic Condition Count 2

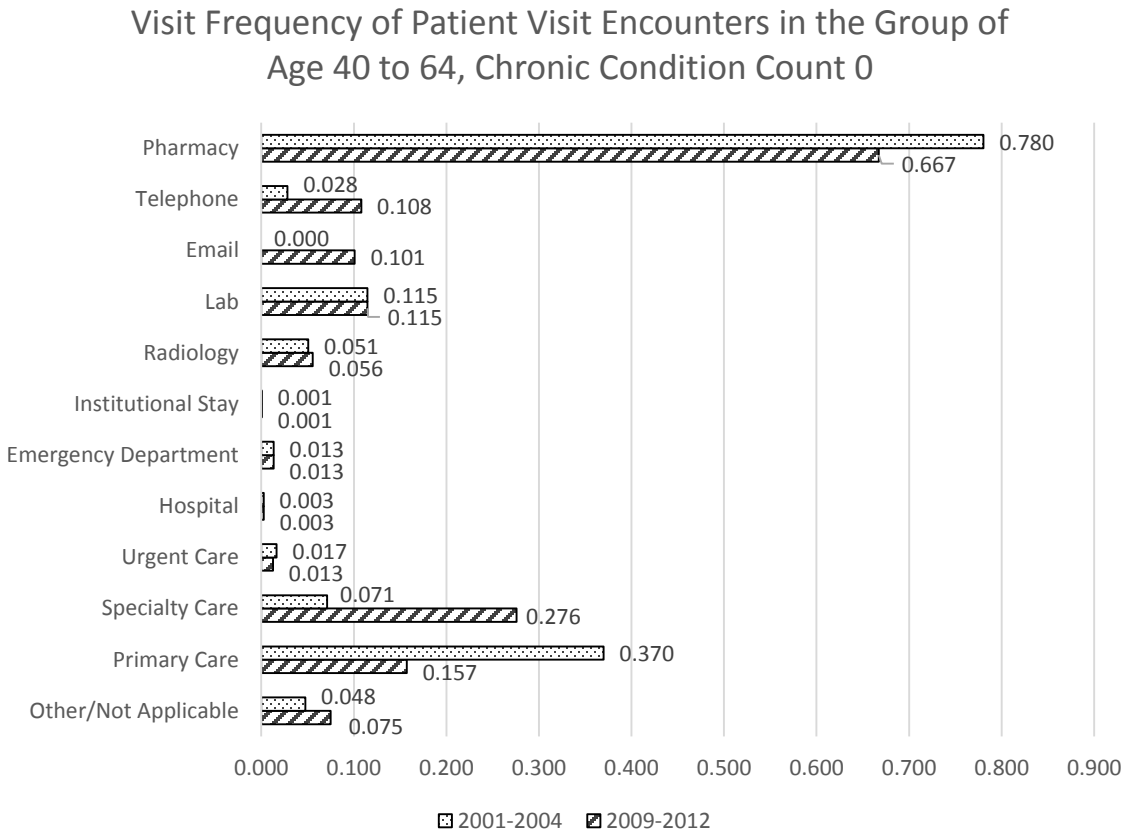

Figure E.4: Visit Frequency of Patient Visit Encounters in the Group of Age 40 to 64, Chronic Condition Count 0

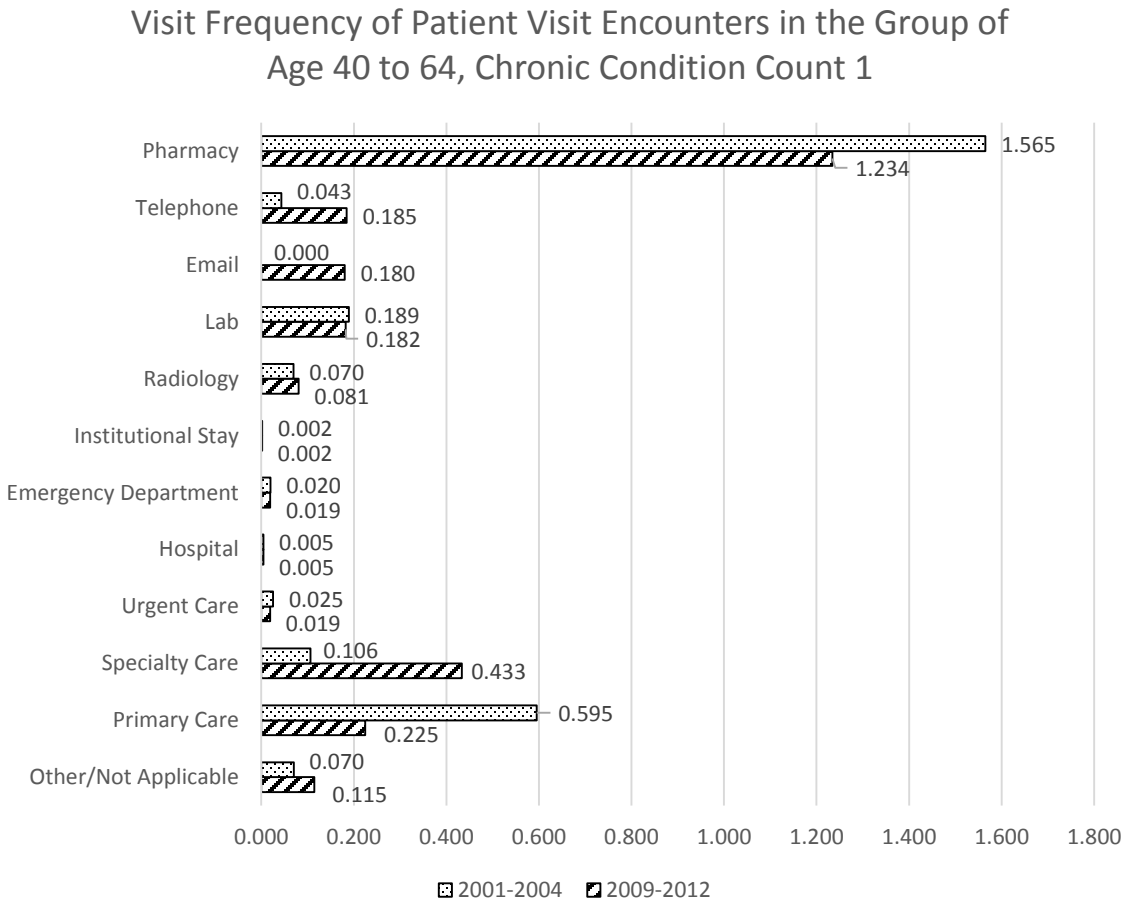

Figure E.5: Visit Frequency of Patient Visit Encounters in the Group of Age 40 to 64, Chronic Condition Count 1

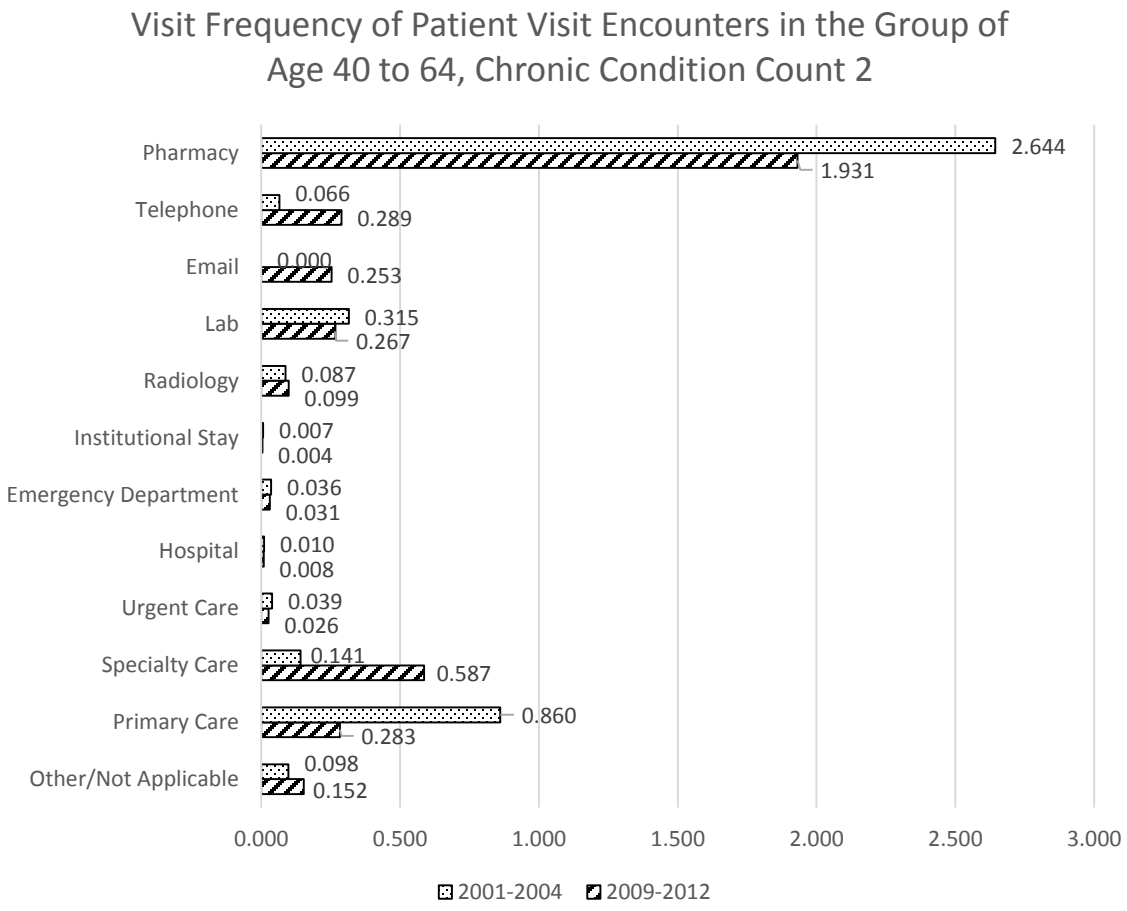

Figure E.6: Visit Frequency of Patient Visit Encounters in the Group of Age 40 to 64, Chronic Condition Count 2

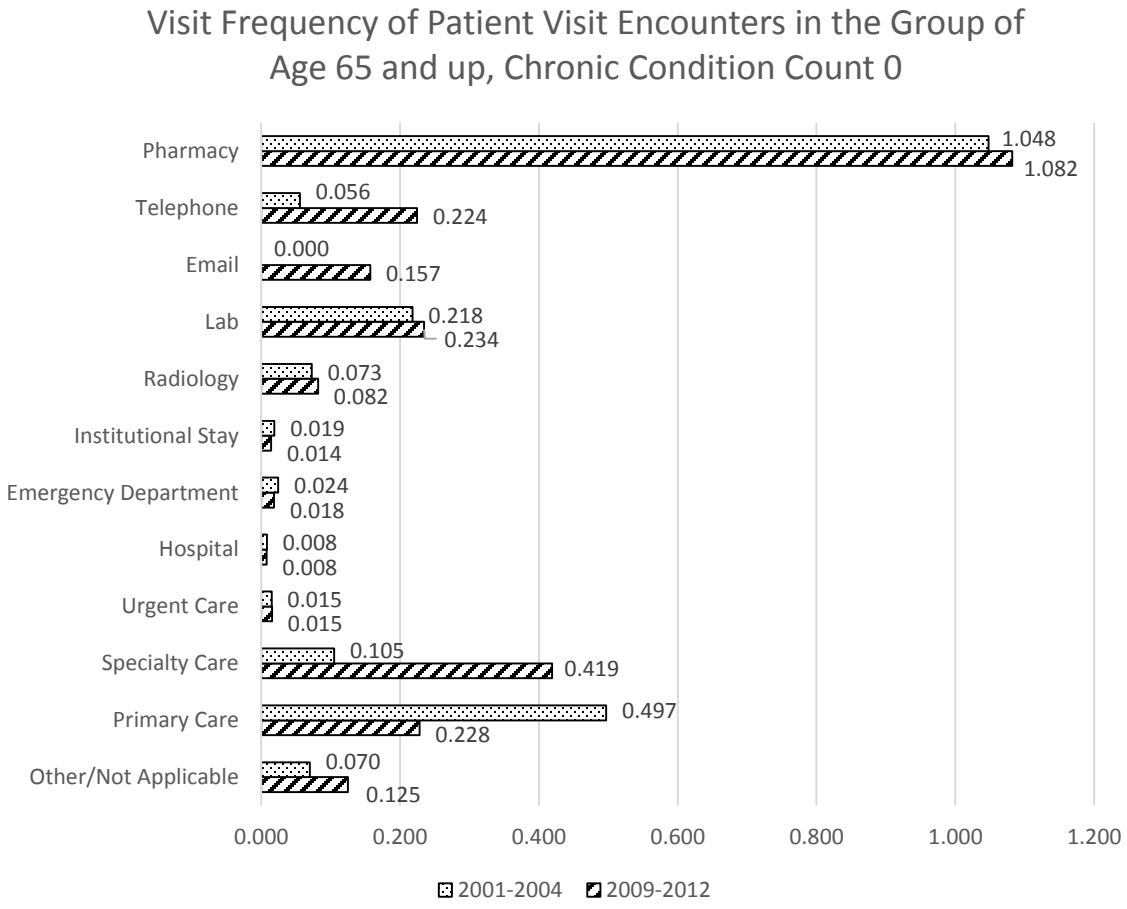

Figure E.7: Visit Frequency of Patient Visit Encounters in the Group of Age 65 and up, Chronic Condition Count 0

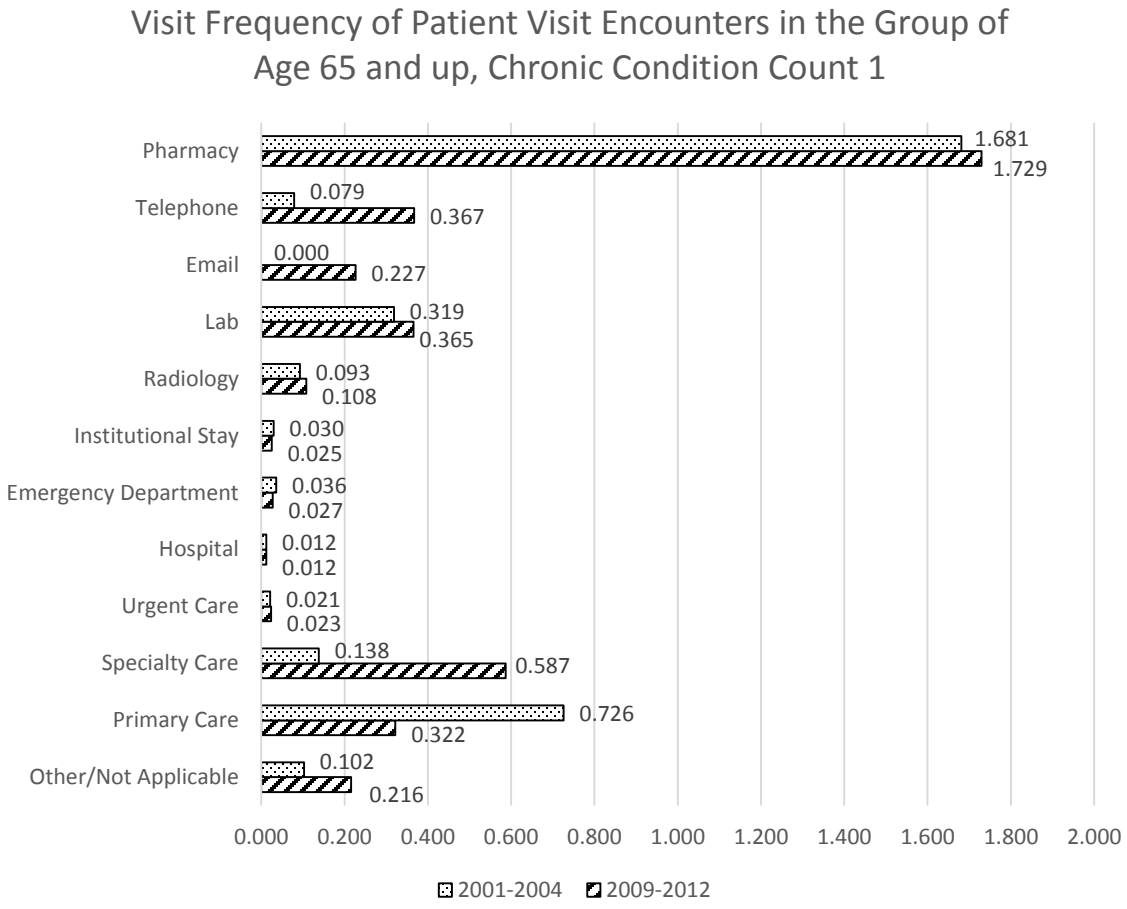

Figure E.8: Visit Frequency of Patient Visit Encounters in the Group of Age 65 and up, Chronic Condition Count 1

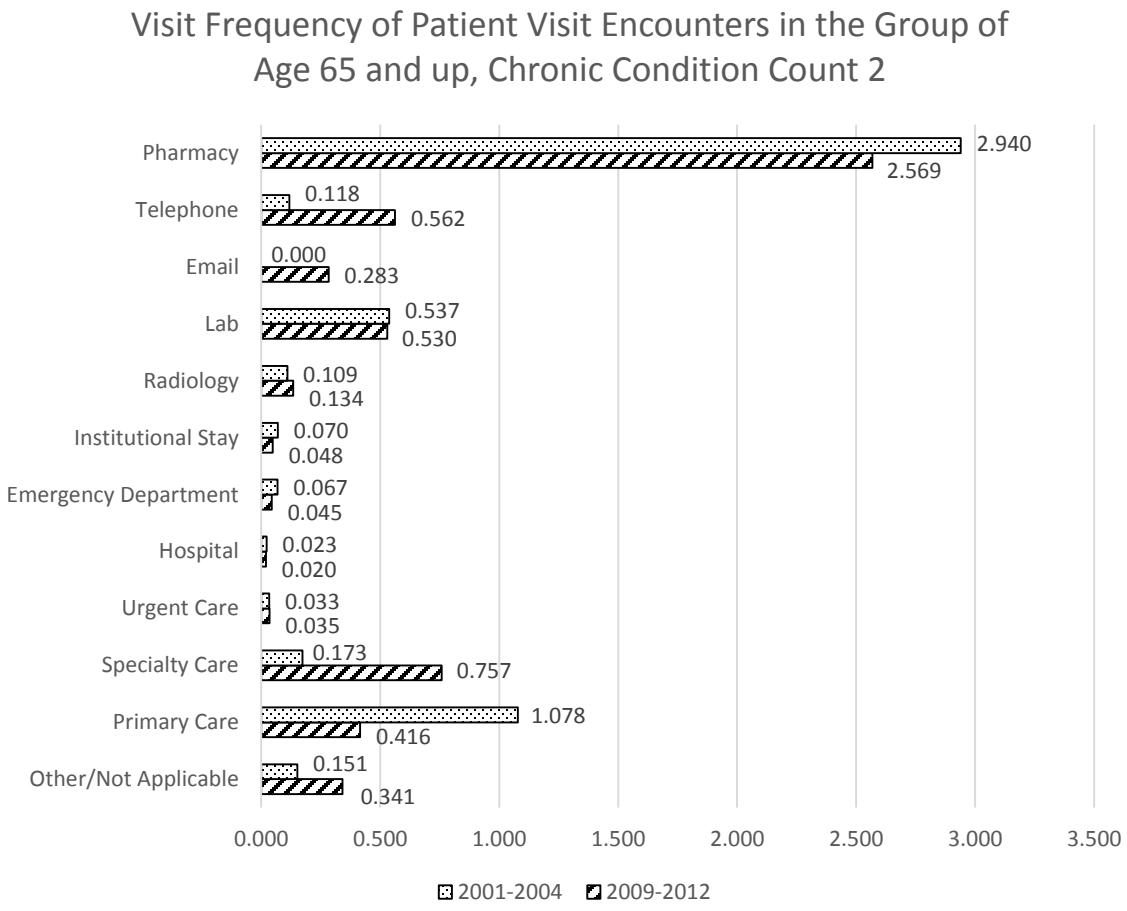

Figure E.9: Visit Frequency of Patient Visit Encounters in the Group of Age 65 and up, Chronic Condition Count 2