

Health Information Technology and Primary Care:
Health Care Lessons from Denmark

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According to most Danes, there is nothing rotten with the state of Denmark's healthcare system.¹ Denmark consistently has a notably high rating of patient satisfaction.² A 2009 survey showed that ninety percent of hospitalized patients rated their experience as good or very good and eighty-nine percent of patients were somewhat or very satisfied with their general practitioner (GP).³ This is not the result of higher health spending. The percentage of gross domestic product (GDP) spent on health care in Denmark was 7.3%, while in the United States that number is currently about 15.3%.⁴ With a high rate of satisfaction and lower health care spending, the U.S. could benefit from a review of certain cost-effective elements of the Danish health care system.

I. INTRODUCTION

Health reform in the U.S., through the recent Patient Protection and Accountable Care Act (PPACA) aims to overhaul a health system with glaring structural defects. Although it is difficult to compare a country of

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1. Kjeld Moller Pedersen, *The Danish Health Care System: Evolution – Not Revolution – in a Decentralized System* 14 HEALTH ECON. 541, 541 (2005).

2. *Id.*

3. Kjeld Moller Pedersen et al., *The Danish Health Care System: An Analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT analysis)* 8 (Institute of Public Health – Health Economics University of Southern Denmark, Health Economic Papers 2, 2011).

4. ELIZABETH G. ARMSTRONG ET AL., *THE HEALTH CARE DILEMMA: A COMPARISON OF HEALTH SYSTEMS IN THREE EUROPEAN COUNTRIES AND THE US* 15 (2011).

5.4 million people with a country of over 300 million current or future patients,⁵ there are certain significant lessons that the U.S. can take from Denmark regarding specific elements of the proposed reform. First, Denmark is known as a leading nation in its effective use of health information technology (HIT).⁶ Second, Denmark has structured its health system around general practitioners who act as “gatekeepers,”⁷ a system the United States is looking to implement via patient-centered medical homes (PCMHs) provided for in the PPACA.⁸ Both of these elements contain the possibility of savings and higher patient satisfaction.

II. THE STRUCTURE OF THE DANISH HEALTH CARE SYSTEM

The Danish health care system is fundamentally different from the U.S. system. According to the Chief Financial Officer of the Copenhagen Hospital, the essential premise of the Danish health care system “is to provide free access to most health services for all people regardless of their economic situation.”⁹ Thus, health coverage in Denmark is universal and free at the point of access.¹⁰ The system is publicly funded through taxes, primarily with a centrally collected income tax of eight percent.¹¹ The priorities of the health care sector stem naturally from Denmark’s overall political structure, which is a welfare-based system.¹²

Danish health care is characterized by its decentralized structure. While

5. *Id.*

6. Denis Protti & Ib Johansen, *Widespread Adoption of Information Technology in Primary Care Physician Offices in Denmark: A Case Study*, 80 THE COMMONWEALTH FUND 1 (March 2010).

7. Pedersen, *Evolution – Not Revolution*, *supra* note 1, at 542.

8. Patient Protection and Affordable Care Act, Pub. L. No. 111-148, § 3502, 124 Stat. 119, 124 (2010). (Section 3502 provides for community health teams to support PCMHs).

9. ARMSTRONG, *supra* note 3, at 3.

10. Karsten Vrangbaek, *The Danish Health Care System*, in INTERNATIONAL PROFILES OF HEALTH CARE SYSTEMS 32, 32 (2011).

11. *Id.*

12. Karsten Vrangbaek & Terkel Christiansen, *Health Policy in Denmark: Leaving the Decentralized Welfare Path?* 30 J. HEALTH POL., POL’Y & L. 29, 33 (2005).

the state is generally in charge of legislation, supervision, monitoring, and the overall framework, the primary responsibility for delivery of care rests with the regions and municipalities.¹³ Delivering care at the lowest administrative level ensures that services are “provided as close to the users as possible.”¹⁴ On January 1, 2007, legislation came into effect that reduced the number of counties from fifteen to five, and the number of municipalities from 271 to 98.¹⁵ The central government meets with the regions and municipalities in annual negotiations where they collectively decide levels of taxation and expenditure.¹⁶

Within each municipality there are self-employed GPs who are paid a combination of capitation, based on the number of patients they serve, and fee-for-service.¹⁷ Danes must register with a GP within fifteen kilometers of their home and GPs average about 1,400 to 1,500 patients.¹⁸ Patients must receive referrals to specialists through their GP, thereby creating a “gatekeeper” function and ensuring that patients do not visit specialists unless it is necessary.¹⁹ Visits with GPs are entirely free, though copayments do exist for some services such as pharmaceuticals, dentistry, and physiotherapy.²⁰ Private insurance is available (and is utilized by about thirty percent of the population) to cover such services as dental care and physiotherapy, as well as coverage for prescription drug cost sharing.²¹ All citizens have been guaranteed choice of hospital since the 1990s, and wait

13. MINISTRY FOR HEALTH PREVENTION, HEALTH CARE IN DENMARK 9 (2008).

14. *Id.* at 7.

15. *Id.* at 8.

16. Vrangbaek, *Danish Health Care System*, *supra* note 10.

17. Protti & Johansen, *supra* note 6, at 3.

18. Background Briefing: Health Care Lessons from Denmark, CIVITAS (2002).

19. Dorte Sindbjerg Martinsen & Karsten Vrangbaek, *The Europeanization of Health Care Governance: Implementing the Market Imperatives of Europe*, 86 PUB. ADMIN. 169, 174 (2008).

20. *Id.*

21. Sarah Thomson & Elias Mossialos, *Primary and Prescription Drugs: Coverage, Cost-Sharing, and Financial Protection in Six European Countries*, 82 COMMONWEALTH FUND 3 (March 2010).

times are capped at one month.²² If a patient has been recommended for a treatment or an operation, they must receive it within thirty days at any public hospital in Denmark or any private hospital that has an agreement with their region.²³ By legislating this right, Denmark has provided a tool to empower patients and combat one of the stigmas of nationalized healthcare.²⁴ However, this solution is still subject to complaint because the provision does not apply to waiting times for elective surgeries, which can be a source of patient dissatisfaction.²⁵ Overall, the general structure of the national coverage plan has been in place since the 1970's, and any slight reforms have maintained the goals of equal access and limited public expenditure.²⁶

III. WHAT THE UNITED STATES CAN LEARN FROM DENMARK'S USE OF HEALTH INFORMATION TECHNOLOGY

In Denmark, all GPs use electronic medical records (EMRs) and ninety-eight percent are able to electronically manage patient care.²⁷ Studies have estimated that the Danish information system saves doctors an average of fifty minutes per day in administrative work.²⁸ Reports have also found that Denmark's use of EMRs saves the health system as much as \$120 million a year.²⁹ Recent legislation has made health information technology (HIT) a

22. Denis Protti et al., *Adoption of Information Technology in Primary Care Physician Offices in New Zealand and Denmark, part 1: Healthcare System Comparisons*, 16 *INFORMATICS IN PRIMARY CARE* 183, 187 (2008).

23. Ulrika Winblad, Karsten Vrangbaek, & Katarina Ostergren, *Do the Waiting-Time Guarantees in the Scandinavian Countries Empower Patients?* 23 *INT'L J. PUB. SECTOR MGMT.* 353, 354 (2010).

24. *Id.* at 361.

25. Armstrong, *supra* note 4, at 9.

26. Vrangbaek & Christiansen, *supra* note 12, at 36-37.

27. Protti & Johansen, *supra* note 6, at 1.

28. Sindya N. Bhanoo, *Denmark Leads the Way in Digital Care*, *N.Y. TIMES*, Jan. 11, 2010, available at <http://www.nytimes.com/2010/01/12/health/12denmark.html>.

29. *Id.*

priority in the U.S. as well.³⁰ With a new emphasis on HIT implementation, the U.S. could benefit from considering how Denmark has successfully utilized this cost-saving measure.

Widespread adoption of HIT came about in Denmark partly because it was mandated but also through peer pressure, technical assistance, and MedCom, a national health system integrator.³¹ MedCom was created in the 1990's and has evolved as an independent organization that is part of the Danish national IT strategy.³² A centralized integrator such as MedCom provides established standards for electronic communication and promotes seamless care across care settings.³³ The Danish dependence on MedCom, an independent company, is a concept that would be palatable to Americans who prioritize maintaining elements of a free market system within the health care sector.³⁴ Although the Danish government set the overall policy agenda regarding HIT, they ultimately stood aside and let the private sector use their expertise to create and implement a high-functioning system.³⁵

The most functional implementation of HIT allows Danish GPs to “electronically manage medication lists, generate problem lists, enter clinical progress notes, access image archives, use external decision-support programs, and send patients automatic reminders for preventive care.”³⁶ Additionally, GPs can use an electronic messaging system to communicate with specialists, hospitals, laboratories, and pharmacies.³⁷ Over ninety percent of all clinical communication between various areas of the health

30. David Blumenthal & Marilyn Tavenner, *The “Meaningful Use” Regulation for Electronic Health Records*, 363 N. ENG. J. MED. 501, 501 (2010).

31. Protti & Johansen, *supra* note 6, at 3.

32. *Id.* at 4.

33. *Id.*

34. Denis Protti et al, *Adoption of Information Technology in Primary Care Physician Offices in New Zealand and Denmark, Part 5: Final Comparisons*, 17 INFORMATICS IN PRIMARY CARE 17, 19 (2009). See generally <http://www.medcom.dk>.

35. *Id.*

36. Protti & Johansen, *supra* note 6, at 1.

37. *Id.* at 2.

care sector occurs electronically.³⁸

In part, the purpose of investing in HIT is to lower costs and improve quality of care,³⁹ both of which are documented results of the digital system in Denmark. Studies have demonstrated that comprehensive adoption of HIT in the United States could save \$142 billion in physician offices and \$371 billion in hospitals over the next fifteen years.⁴⁰ The current administration has flagged HIT as a priority by expressly providing for its implementation in recent legislative measures.⁴¹

In 2009, Congress passed the Health Information Technology for Economic and Clinical Health Act (HITECH)⁴² as a part of the American Recovery and Reinvestment Act (ARRA).⁴³ The federal government designed this Act to incentivize clinicians and hospitals to use EMRs by authorizing payments for improvements in care delivery.⁴⁴ Toward these incentive payments, Congress has earmarked up to \$27 billion over ten years to be paid out through Medicaid and Medicare.⁴⁵ HITECH regulations require that providers demonstrate “meaningful use” of HIT by meeting certain benchmarks.⁴⁶ The purpose of the benchmarks is to ensure that providers prove they are not merely implementing HIT but actually using it in such a way that improves quality of care.⁴⁷ A broad review of studies on healthcare groups that have already implemented some elements

38. *Id.*

39. David Blumenthal, *Launching HITECH*, 362 N. ENG. J. MED. 382, 382 (2010).

40. Gerard F. Anderson et al., *Health Care Spending and Use of Information Technology in OECD Countries*, 25 HEALTH AFFAIRS 819, 821 (2006).

41. Blumenthal & Tavenner, *supra* note 30.

42. *Id.*

43. American Recovery and Reinvestment Act, Pub. L. No. 111-5, §§ 13001-13424, 123 Stat. 115 (2009).

44. Blumenthal & Tavenner, *supra* note 30, at 501.

45. *Id.*

46. Sean O. Hogan & Stephanie M. Kissam, *Measuring Meaningful Use*, 29 HEALTH AFFAIRS 601, 601 (2010).

47. Blumenthal, *supra* note 39.

of HITECH indicate generally positive outcomes.⁴⁸

Although the sheer size of the U.S. means that widespread adoption of HIT will be a more complex undertaking than it was for Denmark, some lessons still carry over. Through HITECH, the U.S. has set an agenda for implementing HIT, and some of the objectives are services that Denmark is currently providing patients.⁴⁹ Among other items, meaningful use objectives require providing patients with electronic versions of their medical records, generating prescriptions, and using clinical-decision making.⁵⁰ In Denmark, all pharmacies are able to receive electronic prescriptions, and GPs enter the prescriptions for medications themselves.⁵¹ The electronic system provides decision support in the form of alerts on potential drug interactions.⁵² Additionally, in 2003, Denmark launched a national e-health portal.⁵³ This successful system provides patients with access to services such as viewing their medication and health data, making GP appointments, general and disease-specific information, and the opportunity to make a Living Will or indicate their wishes to be an organ donor.⁵⁴ Among other HIT items, these services are objectives specifically delineated in HITECH.⁵⁵ Denmark's success in implementing these practices, and their commitment to continually improving their system, offer a useful model for the U.S.

48. Melinda Beeuwkes Buntin et al., *The Benefits of Health Information Technology: A Review of The Recent Literature Shows Predominately Positive Results*, 30 HEALTH AFFAIRS 464, 470 (2011).

49. Blumenthal & Tavenner, *supra* note 30, at 503.

50. *Id.*

51. Protti & Johansen, *supra* note 6, at 6.

52. *Id.*

53. MINISTRY OF HEALTH PREVENTION, *supra* note 13, at 37.

54. *Id.* at 37-38.

55. Blumenthal & Tavenner, *supra* note 30, at 502-03.

IV. WHAT THE UNITED STATES CAN LEARN FROM THE CENTRALITY OF
PRIMARY CARE IN DENMARK

Health Information Technology is just one aspect of Denmark's overall commitment to patient-centered, coordinated care.⁵⁶ While most industrialized countries have experienced an increase in health care spending during recent decades, per capita spending in the United States has outstripped that of other comparable countries.⁵⁷ One frequently cited factor is the fragmented nature of the U.S. system, which leads to misuse of resources and poor coordination of specialists.⁵⁸ To confront this problem, a central theme in the recent health care reform is patient-centered medical care, refocused around primary care.⁵⁹ The goal of this care structure is to increase quality of care and contain costs.⁶⁰ Specifically, many hope that patient-centered medical homes (PCMHs) will be a vehicle for reform.⁶¹ The general principle behind PCMHs is that patients will have close, ongoing contact with a physician who will take the lead in referring the patient to specialists as necessary.⁶² Estimates indicate that the Medicare system alone could save \$194 billion over ten years by moving to a PCMH system.⁶³ To test this concept, the American Academy of Family Physicians launched the National Demonstration Project (NDP) in 2006.⁶⁴

56. Martin Strandberg-Larsen & Allan Krasnik, *Does a Public Single Payer System Deliver Integrated Care? A National Survey Study Among Professional Stakeholders in Denmark*, 8 INT'L J. OF INTEGRATED CARE 1, 1 (JULY 2008).

57. David A. Squires, *The U.S. Health System in Perspective: A Comparison of Twelve Industrialized Nations*, 16 COMMONWEALTH FUND 1, 11 (July 2011).

58. *Id.*

59. Amanda Cassidy, *Health Policy Brief: Patient-Centered Medical Homes*, HEALTH AFFAIRS (September 14, 2010).

60. *Id.*

61. *Id.*

62. *Id.*

63. Karen Davis, *Slowing the Growth of Health Care Costs – Learning from International Experience*, 359 N. ENG. J. MED. 1751, 1762 (2008).

64. Paul A. Nutting et al., *Initial Lessons from the First National Demonstration Project on Practice Transformation to a Patient-Centered Medical Home*, 7 ANNALS FAM. MED. 254, 254 (2009).

While the NDP provided many recommendations, the ultimate result was a determination that a transformation to PCMHs is feasible, but will require tremendous effort and additional resources.⁶⁵ Although the results were inconclusive as to perceived impact on quality of care, the likely explanation for this is that the benefits of this concept cannot be fully realized without system-wide reform integrating primary care with the larger health care system.⁶⁶

A 2008 European Union survey found Denmark to be leading the way in integrating care.⁶⁷ In Denmark, the use of primary care providers as gatekeepers “is the key systemic control on costs.”⁶⁸ The combination fee-for-service and capitation payment system, coupled with the well-organized patient-list system provides quick access to primary care services and ensures that treatment is delivered at the lowest cost possible.⁶⁹ The patient-list system and the defined set of patients assigned to each GP encourage rights and responsibilities for both physicians and patients.⁷⁰ GP practices are structured so that they can handle same-day appointments and walk-ins.⁷¹ This concept provides an example for those who advocate the implementation of PCMHs. Mimicking the Danish style medical home would facilitate continuity of care and potential reduction of emergency room care.⁷² In this regard, Denmark effectively uses after-hours care.⁷³ In 1992, Denmark moved to a system whereby after-hours primary care is

65. Benjamin F. Crabtree, *Summary of the National Demonstration Project and Recommendations for the Patient-Centered Medical Home*, 8 ANNALS FAM. MED. 580, 580 (2010).

66. *Id.* at 583.

67. MARGARET MACADAM, FRAMEWORKS OF INTEGRATED CARE FOR THE ELDERLY: A SYSTEMIC REVIEW, CANADIAN POLICY RESEARCH NETWORKS 14-15 (APRIL 2008).

68. Armstrong et al., *supra* note 4, at 18.

69. Pedersen et al., *supra* note 3, at 39.

70. Karen Davis, PhD, et al., *A 2020 Vision of Patient-Centered Primary Care*, 20 J. GEN. INTERNAL MED. 953, 955 (2005).

71. *Id.*

72. *Id.* at 956.

73. Davis, *Slowing the Growth of Health Care Costs*, *supra* note 63, at 1752.

provided by large organizations covering an entire region.⁷⁴ Through a triage system, patients are guaranteed access to a GP at any hour to determine whether the patient needs a home visit, a consultation, or advice over the phone.⁷⁵ This system has greatly decreased the workload for individual GPs while maintaining patient satisfaction at a relatively stable rate.⁷⁶ Because GPs are available at any time, this aspect of Denmark's primary care lends itself to continuity of care and a reduction in the unnecessary use of emergency care, a result that is a primary goal of PCMHs.

V. CONCLUSION

Structurally, the U.S. is significantly different from Denmark. The U.S. does not have the long-standing emphasis on egalitarianism and social welfare found in Denmark that logically leads to a universal health care system. However, recent health reform in the U.S. opens the path to mimicking certain aspects of the Danish health system that are not strictly tied to a nationalized system. Denmark's effective use of primary care physicians as gatekeepers and related use of HIT provide interesting case studies for priorities that are delineated in the PPACA. The U.S. has already taken steps to encourage the use of HIT. Widespread adoption will require considerable time and effort, and in order for physicians to convert to a digital system, they must be convinced of the benefits. Denmark provides an example of an effective HIT system that has resulted in high patient satisfaction and improved efficiency for providers. This digital system is effective at all levels of care, and will be particularly necessary if

74. Richard Grol et al., *After-Hours Care in the United Kingdom, Denmark, and The Netherlands: New Models*, 25 HEALTH AFFAIRS 1733, 1735 (2006).

75. Morten Bondo Christensen & Frede Olsen, *Out of Hours Service in Denmark: Evaluation Five Years After the Reform*, 316 BRITISH MED. J. 1502, 1502 (1998).

76. *Id.* at 1504.

the U.S. embraces the PCMH model. The PCMH model acknowledges the importance of primary care physicians in reducing the fragmentation of the current system. The PPACA and other initiatives emphasize the implementation of PCMHs in order to improve the quality of care for patients. The PCMH care structure is largely dependent upon HIT and primary care physicians in a gatekeeper role. As the U.S. continues to look to demonstration projects to determine the benefits and feasibility of this undertaking, Denmark provides an effective example. Investment in these efforts to improve health care could prove beneficial despite the risks.