Chapter 5

IS THERE A CORRELATION BETWEEN ECONOMIC CRISIS AND CANCER? A DILEMMA OF CRISIS-CANCER CYCLE

Gülgün ÇİĞDEM¹

Introduction

Crises are social, political, economic and environmental forces that have increasingly gained in importance. Likewise, crises have the potential to cause damage by creating sudden changes. Crises generating widespread and systematic damage with this detrimental potential can also be a significant driving force affecting structural alteration, growth, and innovation. Furthermore, crises can make institutions better, they can alter society and the how the ecosystem functions. They can weaken economic stability and change beliefs. Given these aspects, it is very important to understanding the meaning and the effects of crises (Sellnow&Seeger, 2014). Another significant subject for the present day is cancer. It is one of the biggest problems with health ranking high among the causes of death and second only to cardiovascular diseases in terms of morbidity. In particular, cancer when diagnosed later can result in organ failure and death. It is a main reason of organ damage, especially death in delayed cases, and is likely to settle into first place in the near future. Cancer, which reduces life expectancy, particularly when diagnosed late, is very expensive to treat and subjects both the patient and his / her relatives to psychological pressure. Cancer is also very important in terms of its detrimental effects on the economy. In the fight against cancer, it is imperative to be organized (Saltık, 2013). "In 2017, 1,688,780 new cancer cases and 600,920 cancer deaths are projected to occur in the United States" representing about 1,650 deaths per day (Siegel, Miller & Jemal, 2017). "In 2018, an estimated 1,735,350 new cases of cancer will be diagnosed in the United States and 609,640 people will die from the disease" (National Cancer Institute, a), "which translates to about 1,670 deaths per day. Cancer is the second most common cause of death in the US, exceeded only by heart disease" (National Cancer Institute, b).

The American Cancer Society predicts that by 2030, this global burden will result in "21.7 million new cancer cases and 13 million cancer deaths". Apart from this dreadful view on the global scale, the economic dimension of cancer is increasing in importance day by day. Although there are no precise data due to the irregularity of records and notifications, accordingly the World Health Organization, the whole an-

¹Asst. Prof., Istanbul Gelişim University, gulguncigdem@gmail.com https://orcid.org/0000-0001-5353-8638

of cancer are not kept regularly and the registration centers are not notified; therefore, the real figures are likely much higher than the data. In 2030, the numbers of new cancer cases and deaths are expected to rise to 21.6 billion and 13 million, respectively. This study adds a new cause to the known causes of this debilitating or fatal disease, which is a very important problem for economies due to the resultant loss of workforce and production in addition to diagnosis and treatment costs. According to this study, there is a cycle between *crisis* and *cancer*. Economic crises result in unemployment, poverty, loss of labor, and loss of income. These changes in the macroeconomic environment, which cause a decline in the socio-economic status of the individual, lead to anxiety, stress, a weakening of the immune system, and a shortening of telomers, resulting in cancer. Some studies on specific phases of the "Crisis-Cancer Cycle," as expressed by this work, which establishes a relationship between crisis and cancer, offer genetic evidence but this cycle needs more empirical research. Cancer places a heavy economic burden on humanity and the global economy. Rather than carrying this burden, it will be more "affordable" in terms of the necessary costs to prevent economic crises that trigger illness in the cycle of crisis-cancer. Taking some simple economic precautions will prevent a significant portion of the disease. Scientists are now paying close attention to the fact that 30%-50% of cancer cases can be prevented. Policies that will be developed in a coordinated manner around the world need to consider this cycle. The consequences of this and future work are important in the development of policies to prevent cancer and reduce the burden on the economy. The aim of this study, which is prepared within the framework of the interdisciplinary approach and which contributes to the addition of new factors to the causes of cancer, is to draw attention to the Crisis-Cancer Cycle and to create a point of departure for future empirical studies. From this point of view, this work is a contribution.

References

Agerbo, A. (2005). Effect of Psychiatric Illness and Labour Market Status on Suicide: A Healthy Worker Effect? Epidemiol Community Health, 59,598-602.

Akinyemiju, T.F., Soliman, A.S., Johnson, N.J., Altekruse, S.F., Welch, K., Banerjee, M., Schwartz, K. & Merajver, S. (2013). Individual and Neighborhood Socioeconomic Status and Healthcare Resources in Relation to Black-White Breast Cancer Survival Disparities. J. Cancer Epidemiol. 2013;2013:490472. doi: 10.1155/2013/490472.

American Cancer Society. Cancer Facts and Figures 2018. (Retrieved from https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf).

Apak, S. & Aytaç, A. (2009). Küresel Krizler, Kronolojik Değerlendirme ve Analiz, Avcıol Basım Yayın. Artazcoz L., Benach J., Borrell C. et al. (2004). Unemployment and Mental Health: Understanding the Interactions Among Gender, Family Roles, and Social Class. American Journal of Public Health, 94(1), 82-8.

Barton, L. (2001). Crisis in organizations II (2nd edn.). Cincinnati: College Divisions South-Western. Benzeval, M. & Judge, K. (2001). Income and Health: The Time Dimension. Social Science and Medicine, 52, 1371-1390.

Bernanke, Ben. S. (2009). The Crisis and the Policy Response, Stamp Lecture, London School of Economics, London England. (Retrieved from http://www.federalreserve.gov/newsevents/speech/bernanke20090113a.htm).

Blackburn, E.H. (2014). Reconciling Stress and Cancer: Insights from Telomeres. Ed. Stewart W. Bernard and Wild, Christopher P. World Cancer Report. International Agency for Research on Cancer. 77-80.

Blakely, T.A., Collings, S.C. & Atkinson, J. (2003). Unemployment and Suicide. Evidence for a Causal Association? Journal of Epidemiology and Community Health, 57(8), 594-600.

Boscoe, F.P., Johnson, C.J., Sherman, R.L., Stinchcomb, D.G., Lin, G. & Henry, K.A. (2014). The Relationship Between Area Poverty Rate and Site-SpecificCancer Incidence in the United States. Cancer, 120(14), 2191-2198.

Bosanquet, N. & Sikora, K. (2006). The Economics of Cancer Care. Cambridge University Press.

Bradley, C.J. et al. (2008). Productivity Costs of Cancer Mortality in the United States: 2000–2020. J. Natl. Cancer Inst. 100:1763 – 1770.

Caballero, R. J. & Kurlat, P. (2009). The "Surprising" Origin and Nature of Financial Crises: A Macroeconomic Policy Proposal. Massachusetts Institute of Technology Department of Economics Working Paper Series, 09-24.

Can, H. (1992). Yönetim ve Organizasyon, 2. Baskı, Adım Yav., Ankara.

Cancer Facts & Figures. (2018). American Cancer Society. (Retrieved from https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf).

Carter, H.E., Schofield, D.J., Shrestha, R. (2016). The Productivity Costs of Premature Mortality Due to Cancer in Australia: Evidence from a Microsimulation Model. PLoS ONE 11(12):e0167521. doi:10.1371/journal.pone.0167521

Chang, S.S. et al. (2009). Was the Economic Crisis 1997–1998 Responsible for Rising Suicide Rates in East/Southeast Asia? A Time-Trend Analysis for Japan, Hong Kong, South Korea, Taiwan, Singapore and Thailand. Social Science and Medicine, 68, 1322–1331.

Chang, Y.S., Jalgaonkar, S.P., Middleton, J.D. ve Hai, Tsonwin. (2017). Stress-Inducible Gene Atf3 in the Noncancer Host Cells Contributes to Chemotherapy-Exacerbated Breast Cancer Metastasis. Proc. Natl. Acad. Sci. U.S.A., 22;114(34), 7159-7168.

Chatterjee, S. et al. (2017). Disparities in Gynecological Malignancies. Ed. Temkin, S. Cancer Care Delivery and Women's Health. Published in: Frontiers in Oncology, 51-58.

Chow, M.T., Möller, A. & Smyth, M.J. (2012). Inflammation and Immune Surveillance in Cancer, Seminars in Cancer Biology, 22, 23–32.

Clark, A. & Oswald, A.J. (1994). Unhappiness and Unemployment, Economic Journal, 104, 648–659.

Coombs, W. T. (2018). Ongoing Crisis Communication: Planning, Managing, and Responding. Texas A&M University, College Station, Texas, USA, Fifth Edition.

Creed, P. (1998). Improving the Mental and Physical Health of Unemployed People: Why and How? Med. J. Aust., 168, 177–78.

Çiğdem, G. (2014). Küresel Ekonomik Kriz ve Etkileri ve Medya. Umuttepe Yayıncılık.

Deaton, A. (2003). Health, Inequality, and Economic Development. Journal of Economic Literature, 41(1), 113-158.

Dee, T.S. (2001). Alcohol Abuse and Economic Conditions: Evidence from Repeated Cross-Sections of Individual-Level Data. Health Economics, 10, 257–270.

Dooley, D., Catalano, R. & Wilson, G. (1994). Depression and Unemployment: Panel Findings from the Epidemiological Catchment Area Study. American Journal of Community Psychology, 22, 745-65.

Dorling, D. (2009). Unemployment and Health. British Medical Journal, 338:b829.

Edwards, S. (2001). Does the Current Account Matter? Ed. Sebastian Edwards ve Jeffrey A. Frankel. Preventing Currency Crises in Emerging Markets. University of Chicago Press.

Edwards, R. (2008). Who is Hurt by Procyclical Mortality? Social Science and Medicine, 67:,051–2058. Edwards, S. & Santaella, J.A. (1993). Devaluation Controversies in the Developing Countries: Lessons from the Bretton Woods Era. Ed. Michael D. Bordo ve Barry Eichengreen. A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform. University of Chicago Press.

Ehrlich, P. (1909). Ueber den Jetzigen Stand der Karzinomforschung. Ned Tijdschr Geneeskd, 5, 273–90.

Eichengreen, B. & Portes, R.(1987). The Anatomy of Financial Crises. NBER Working Paper No.2126. (Retrieved from https://www.nber.org/papers/w2126).

Ennis, K.Y., Chen, M.-H., Smith, G.C., D'Amico, A.V., Zhang, Y., Quinn, S. A., Ryemon, S.N., Goltz, D., Harrison, L.B. & Ennis, R.D. (2015). The Impact of Economic Recession on the Incidence and Treatment of Cancer, 6, 727-733.

Nicholls, M. (2015). Nobel Prize Laureate Elizabeth H. Blackburn's: A Journey to Stockholm at ESC Congress London. European Heart Journal. (Retrieved from https://academic.oup.com/eurheartj/article/36/45/3128/2293485).

Fearn-Banks, K. (1996). Crisis Communication: A Casebook Approach. Mahwah, NJ: Lawrence Erlbaum Associates.

Ferlay, J., Shin, H.-R., Bray, F., Forman, D., Mathers, C. & Parkin, D.M. (2010). Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. International Journal of Cancer, 127, 2893–2917.

Fink, S. (1986). Crisis Management: Planning for the Inevitable. American Management Association. Frankel, J.A. & Rose, A. (1996). Currency Crashes in Emerging Markets: An Empirical Treatment. Journal of International Economics, 41, 351–66.

Friedman, M. (2002). Everyday Crisis Management: How To Think Like an Emergency Physician. Naperville, IL: First Decision Press.

Gouin, J.-P., Hantsooa, L. & Kiecolt-Glasera, J.K. (2008). Immune Dysregulation and Chronic Stress Among Older Adults: A Review. Neuroimmunomodulation. 15(4-6), 251–259. (Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2676338/pdf/nihms-109812.pdf).

Gunnell, D. et al. (1999). Suicide and Unemployment in Young People. Analysis of Trends in England and Wales, 1921–1995. British Journal of Psychiatry, 175, 263–270.

Gunnell, D., Harbord, R., Singleton, N. et al. (2004). Factors Influencing the Development and Amelioration of Suicidal Thoughts in the General Population. British Journal of Psychiatry, 185, 385-93.

Hammarström, A. (1994). Health Consequences of Youth Unemployment—Review from a Gender Perspective. Soc. Sci. Med., 38: 699–709.

Hanly, P.A. & Sharp, L. (2014). The Cost of Lost Productivity Due To Premature Cancer-Related Mortality: An Economic Measure of the Cancer Burden. BMC Cancer, 14:224.

Hanly, P., Soerjomataram, i. & Sahrp, L. (2015). Measuring the Societal Burden of Cancer: The Cost of Lost Productivity Due To Premature Cancer-Related Mortality in Europe. Int. J. Cancer: 136, E136–E145.

Herbert, J. (1997). Stress, the Brain and Mental Illness. BMJ, 315(7107), 530-535. Irvine, Robert B. (1987). What's a Crisis, Anyway, Midyear Special, 4.

Jemal, A., Simard, E.P., Dorell, C., et al. (2013). Annual Report to the Nationon the Status of Cancer, 1975-2009, Featuring the Burden and Trends in Human Papillomavirus (HPV)-Associated Cancers and HPV Vaccination Coverage Levels. J. Natl. Cancer Inst., 105, 175-201.

Kaplan, G.A., Pamuk, E.R., Lynch, J.W., Cohen, R.D. & Balfour, J.L. (1996). Inequality in Income and Mortality in the United States: Analysis of Mortality and Potential Pathways. BMJ, 312, 999–1003.

Karanikolos, M., Mladovsky, P., Cylus, J., Thomson, S., Basu, S., Stuckler, D., Mackenbach, J.P. & McKee, M. (2013). Financial Crisis, Austerity, and Health in Europe. The Lancet. (Retrieved from http://www.antoniocasella.eu/salute/lancet_crisis_health_27mar13.pdf).

Kim, J.M., Kim, H.-M., Jung, B.-Y., Park, E.-C., Cho, W.-H. & Lee, S.G. (2012). The Association Between Cancer Incidence and Family Income: Analysis of Korean National Health Insurance Cancer Registration Data. Asian Pacific Journal of Cancer Prevention, 13, 1371-1376.

Klein-Hesselink, D.J. & Spruit, I.P. (1992). The Contribution of Unemployment to Socioeconomic Health Differences. Int. J. Epidemiol, 21, 329–37.

Kupperman, R.H., Wilcox, R.H. & Smith, H.A. (1975). Crisis Management: Some Opportunities. Science New Series. 187/4175, 404-410.

Lewis, G. & Sloggett, A. (1998). Suicide, Deprivation, and Unemployment: Record Linkage Study. BMJ, 317(7168),1283-6.

Mathers, C.D. & Schofield, D.J. (1998). The Health Consequences of Unemployment: the Evidence. Medical Journal of Australia, 168, 178-83.

Mariotto, AB., Yabroff, K.R., Shao, Y., Feuer, E.J. & Brown, M.L. (2011). Projections of the Cost of Cancer Care in the United States: 2010-2020. J. Natl. Cancer Inst., 103(2), 117-28.

Marmot, M.G. (2009). How Will the Financial Crisis Affect Health? BMJ, 338:b1314.

Maruthappu, M. et al. (2016). Economic Downturns, Universal Healthcare Coverage, and Cancer Mortality in High- and Middle-Income Countries, 1990–2010: a Longitudinal Analysis. The Lancet, 388(10045), 684-695.

McKee-Ryan, F. et al. (2005). Psychological and Physical Well-Being During Unemployment: a Meta-Analytic Study. Journal of Applied Psychology, 90, 53–76.

Mitroff, I. I., & Anagnos, G. (2001). Managing Crises Before They Happen: What Every Executive and Manager Needs to Know About Crisis Management. New York: AMACOM.

Morris, J., Cook, D. & Shaper, G. (1994). Loss of Employment and Mortality. BMJ, 308: 1135-39.

Murphy, G. & Athanasou, J.A. (1999). The Effect of Unemployment on Mental Health. Journal of Occupational and Organizational Psychology, 72, 83–99.

Narendra, B.L., Reddy, K.E., Shantikumar, S. & Ramakrishma, S. (2013). Immune System: a Double-Edged Sword in Cancer. Springer, Basel. (Retrieved from https://www.researchgate.net/publication/250920249_Immune_system_A_double-edged_sword_in_cancer).

National Cancer Institude, a. Statistics at a Glance: The Burden of Cancer in the United States. (Retrieved from https://www.cancer.gov/aboutcancer/understanding/statistics).

National Cancer Institude, b. How Many New Cases and Deaths Are Expected to Occur in 2018?. (Retrieved from https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf).

O'Donnell, O., E. van Doorslaer & Ourti, T. V. (2013). Health and Inequality. Netspar Discussion Papers, 10/2013-060.

OECD. (2017). Health at a Glance: OECD Indicators, OECD Publishing, Paris. http://dx.doi.org/10.1787/health_glance-2017-en

Özgüven, A. (2001). İktisadi Krizler, Yeni Türkiye Dergisi, Cilt:1, 7/41, 56-63.

Padgett, D.A. & Glaser, R. (2003). How Stress Influences the Immune Response. Trends in Immunology, 24(8), 444-448.

Pearce, A., Bradley, C., Hanly, P., O'Neill, C., Thomas, A.A., Molcho, M. & Sharp, L. (2016). Projecting Productivity Losses for Cancer-Related Mortality 2011 – 2030. BMC Cancer, 2016, 16(1), Page 1.

Pearce A., Hanly P., Sharp L. & Soerjomataram, I. (2015). The Burden of Cancer in Emerging Economies: Productivity Loss as an Alternative Perspective. Value Health. 18(7):A336. doi: 10.1016/j. jval.2015.09.118.

Pearce A., Sharp L., Hanly P., Barchuk A., Bray F., de Camargo Cancela M. et al. (2018). Productivity Losses Due to Premature Mortality From Cancer in Brazil, Russia, India, China, and South Africa (BRICS): a Population-Based Comparison. Cancer Epidemiol. http://dx.doi.org/10.1016/j.canep.2017.12.013 PMID:29353153

Pearson, C. M., & Clair, J. (1998). Reframing Crisis Management. The Academy of Management Review, 23(1), 59-76.

Preble, J. F. (1997). Integrating the Crisis Management Perspective into the Strategic Management Process. Journal of Management Studies, 34(5), 769-791.

Regester, M. (1989).Crisis Management: What to Do When the Unthinkable Happens. London: Hutchinson Business.

Reiche, E.M.V., Nunes, S.O.V. & Morimoto, H.K. (2004). Stress, Depression, the Immune System, and Cancer. The Lancet Oncology, 5, 617-625.

Robins, H. (2013). Immunosequencing: Applications of Immune Repertoire Deep Sequencing. Current Opinion Immunology, 25, 646-652.

Saltık, A. (2013). Kanser Epidemiyolojisi. (Retrieved from http://ahmetsaltik.net/arsiv/2013/10/Kanser_Epidemiyolojisi_Ahmet_SALTIK.pdf.pdf).

Sellnow, T.L. & Seeger, M.W. (2014). Theorizing Crisis Communication. UK: Wiley-Blackwell Publishing.

Seeger, M. W., Sellnow, T. L. & Ulmer, R. R. (1998). Communication, organization and crisis. In M. E. Roloff (Eds.), Communication Yearbook, 21, 231–275.

Segerstrom, S.C., & Miller, G.E. (2004). Psychological Stress and the Human Immune System: A Meta-Analytic Study of 30 Years of Inquiry. Psychological Bulletin, 130(4), 601-630.

Shelby, C., Chizoba, N. & Ralph, I. (2018). Lost Annual Productivity Costs Due To Cervical Cancer Deaths in the United States in 2014. J. Clin. Oncol., 36, 2018 (suppl; abstr e17513)

Siegel, R., Miller, K.D.&Jemal, A. (2017). Cancer statistics. CA: A Cancer Journal for Clinicians 2017; 67(1).

Singh, GK, Siahpush, M. & Altekruse, SF. (2013). Time Trends in Liver Cancer Mortality, Inciden-ce, and Risk Factors by Unemployment Level and Race/Ethnicity, United States, 1969-2011. Journal of Community Health, 38, 926-940.

Surtees, P.G., Wainwright, N.W.J., Pooley, K.A., Luben, R.N., Khaw, K.-T., Easton, D.F. & Dunning, A.M. (2011). Life Stress, Emotional Health, and Mean Telomere Length in the European Prospective Investigation into Cancer (EPIC)-Norfolk Population Study. Journal of Gerontology: Biological Sciences, 66A(11), 1152-1162

Stuckler, D. et al. (2009). The Public Health Effect of Economic Crises and Alternative Policy Responses in Europe: an Empirical Analysis. Lancet, 374, 315–323.

The Cancer Atlas. (Retrieved from canceratlas.cancer.org).

Tougeron, D., Fauquembergue, É. & Latouche, J.-B. (2013). Réponse Immunitaire et Cancers ColorectauxImmune Response and Colorectal Cancer. Bulletin du Cancer, 100 (3), 283-294.

Tüba Ulusal Kanser Politikaları Çalıştayı Raporu. (2014). (Retrieved from http://www.tuba.gov.tr/upload/files/tubayla_ilgili/Kanser%20%C3%87al%C4%B1%C5%9Ftay%C4%B1%20Raporu_compressed.pdf).

TÜİK. (04 Mayıs 2017). Basın Odası Haberleri. (Retrieved from http://www.tuik.gov.tr/basinOdasi/haberler/2017_24_20170504.pdf).

Ungváry, G., Morvai, V. & Nagy, I. (1999). Health Risk of Unemployment. Central Eur JOEM, 5, 91–112. United Nations. Over \$46 Billion Lost To Premature Cancer Deaths in BRICS Economies, UN Research Finds. (Retrieved from https://news.un.org/en/story/2018/01/1001701).

Wilkinson, R., Marmot, M., Eds. Social Determinants of Health: the Solid Facts. 2nd ed. Copenhagen, WHO Regional Office for Europe, 2003 (Retrieved from http://www.euro.who.int/en/what-wepublish/abstracts/social-determinants-of-health.-the-solid-facts).

World Health Organization (WHO). Key Facts. (Retrieved from http://www.who.int/news-room/fact-sheets/detail/cancer).

World Health Organisation (WHO) (2009). Financial Crisis and Global Health: Report of a High-Level Consultation. Geneva, World Health Organization. (Retrieved from http://www.who.int/mediacentre/events/meetings/2009_financial_crisis_report_en_.pdf).

World Health Organisation (WHO) (2011). Impact of Economic Crises on Mental Health. (Retrieved from http://www.euro.who.int/_data/assets/pdf_file/0008/134999/e94837.pdf).

Yabroff, K.R. et al. (2008). Estimates and Projections of Value of Life Lost From Cancer Deaths in the United States. J. Natl. Cancer Inst., 100:1755 - 1762.

Yang, B. & Lester, D. (1995). Suicide, Homicide and Unemployment. Appl. Econ. Lett., 2, 278-9.

Zdziarski, E. & Rollo, J.M. (2007). The Impact of Crisis. In Campus Crisis Management: A Comprehensive Guide to Planning, Prevention, Response, and Recovery. Ed. Zdziarski, E., 3-34. San Fransisco: Jossey-Bass.