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Original Research

Time to diagnosis and treatment for cancer patients in the Netherlands: Room for improvement?

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Abstract ***Background & aim:*** Reducing the duration of the diagnostic cancer care pathway is intensively pursued. The aim of this study was to chart the diagnostic pathway for the five most common cancers in the Netherlands.
Methods: A retrospective cohort study using cancer patients' anonymised primary care data (free text and coded) linked to the Netherlands Cancer Registry. We determined the median duration of the following: 1. Primary care intervals (IPCs): the first cancer-related general practitioner consultation to referral, 2. Referral intervals (IRs): referral to diagnosis, 3. Treatment intervals (ITs): diagnosis to treatment and the overarching intervals, 4. Diagnostic intervals (IDs): IPC and IR combined and 5. Health care intervals (IHCs): IPC, IR and IT combined.
Results: For 465, 309, 197, 237 and 149 patients diagnosed with breast-, colorectal-, lung-, prostate cancer and melanoma, respectively; median IPC, IR and ID durations were shortest for breast cancer and melanoma (ID duration 7 and 21 days, respectively), intermediate for lung- and colon cancer (ID duration 49 and 54 days) and the longest for prostate cancer (ID duration 137 days). For all cancers, the duration of intervals increased steeply for the 10–25% with longest durations. For colorectal cancer, increasing ID durations showed increasing proportions of time attributable to primary care (IPC).
Conclusion: Approximately 10–25% of cancer patients show substantially long duration of diagnostic intervals. Reducing primary care delay seems particularly relevant for colorectal cancer.

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1. Introduction

Despite improving treatment outcomes, cancer is a major health problem with high morbidity and mortality rates worldwide. Prognosis largely depends on tumour stage at diagnosis [1,2]. Early diagnosis and treatment is considered vital to improve patient outcome and to reduce time spent in insecurity for patients [3,4]. Even though the association between time intervals in the diagnostic pathway and clinical outcomes is complex and remains debated, evidence suggests worse outcomes after longer diagnostic intervals [5,6]. Optimising the diagnostic pathway from first presentation to diagnosis and start of treatment, usually interpreted as shortening the diagnostic phase, has therefore been a main objective of health care organisations involved in cancer care worldwide.

The Aarhus statement defines several key time points and associated intervals in the diagnostic pathway [7]. The primary care interval (IPC) is the time between the first cancer symptom related contact with the general practitioner (GP) and its corresponding referral to secondary care. The referral interval (IR) can be defined as the time from referral to histological diagnosis and the treatment interval (IT) is defined as the time from diagnosis to initiation of the treatment. Overarching intervals are the diagnostic interval (ID): the time from the first presentation to the GP to diagnosis and the health care interval (IHC): the time from the first presentation to the GP to initial treatment.

For some countries in Europe, the duration of several of these intervals has been charted. All diagnostic intervals, but particularly the IPC, are usually shorter for cancers presenting with visible or palpable symptoms such as breast cancer and melanoma [4,8–11]. For other countries, such as the Netherlands, the duration of these intervals is unknown.

International comparison of the duration of IDs in different health care systems and cultural environments is important to identify system-, disease- and patient-related factors that contribute to an unnecessarily prolonged patient journey. Analyses of cancer survival rates show that health care systems with a gatekeeping role of the GP have a significantly lower relative cancer survival than systems without a gatekeeper function [12]. This observation was followed by a study addressing the question if serious problems in cancer survival are partly rooted in gatekeeper principles [13]. This ecologic analysis of relatively old data showed that having a gatekeeper system was associated with lower 1-year survival in health care systems with primary care-based gatekeeping.

These findings suggest that a primary care-based gatekeeper system could delay cancer diagnosis as a result of a long duration of the ID and the underlying IPC and IR.

The health care system in the Netherlands is based on a strict gatekeeper role of the GP, which means secondary care facilities are almost exclusively accessible through referral from primary care (see Box 1). Exploring the duration of the diagnostic pathway in the Netherlands and the contribution of primary care to this pathway, generate relevant information on international differences in the duration of the diagnostic pathway. This provides the opportunity to distinguish underlying mechanisms of delay, including system-, disease- and patient-related delay.

Therefore, we aim to assess the duration of the diagnostic pathway and its underlying intervals for the five most frequently occurring cancer types in the Netherlands: Colorectal-, breast-, lung-, prostate cancer and melanoma, with a particular focus on the potential role of the GP in the diagnostic process.

2. Methods

2.1. Design

We conducted a retrospective cohort study using routine primary care data from the Julius General Practitioners Network (JGPN) database, linked to the data of the Netherlands Cancer Registry (NCR). We used a trusted third-party linkage procedure to comply with privacy regulations of the Dutch law. The JGPN, the NCR and the linkage procedure are described in detail elsewhere [18].

Box 1. Organisation and characteristics of primary care in the Netherlands

Primary care in the Netherlands

- All Dutch citizens are listed with a GP.
- GP services are free: costs for GP encounters are covered by basic insurance, which is obligatory for every citizen by law.
- The GP is the gatekeeper to secondary care.
- At the time of the study there were approximately 8900 employed GPs in the Netherlands [14].
- The practice norm for the number of patients was 2350 patients per GP practice [15].
- For 75% of Dutch citizens, the nearest GP was situated within one kilometre, and for less than 1% of the people, this distance was longer than five kilometers [16].

Primary care and cancer

- On average, a full time Dutch GP sees 25 new adult cancer patients each year (including all types of skin cancer) [17].
- In the study period, a national screening program for breast cancer and cervical cancer was available in the Netherlands. For colorectal cancer a national screening programme started in 2014.