

Predictors of the survival of gastric cancer patients diagnosed at Bhaktapur Cancer Hospital, Nepal – A retrospective cohort study

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under the supervision of Professor Andrew Hayen and Dr Daniel Demant

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, *Krishna Kanta Poudel*, declare that this thesis is submitted in fulfilment of the requirements for the award of *Doctor of Philosophy*, in the School of Public Health, *Faculty of Health* at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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Abstract

Gastric cancer was the fourth most common cause of cancer-related deaths worldwide in 2020. In Nepal, gastric cancer was the second most common cause of cancer deaths in males and the fifth most common cause of cancer deaths in females in 2020. Although gastric cancer is a significant public health problem, there have been no studies undertaken in Nepal to determine the survival and predictors of gastric cancer survival.

This retrospective cohort study investigated the overall survival rate of people with gastric cancer and predictors of survival. We included 817 people who were diagnosed with gastric cancer between 1 January 2010 and 31 December 2021 at Bhaktapur Cancer Hospital, Nepal.

The median overall survival for patients with gastric cancer was 19 months. The total person-time of follow-up was 17,808 months. Survival at one year was 70%, 37% at two-years, 23% at three-years, 18% at four- years, and 12% at five-years. Factors that affected survival included age, tumour locations, tumour stage at diagnosis, treatment by surgery, and treatment by chemotherapy.

This study was limited by the data that was available in the routine medical records, however; to investigate additional potential predictors for survival of gastric cancer, and reduce survival bias, future research should include a prospective study design.

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Abbreviations

AAPC:	Average Annual Percent Change
AJCC:	American Joint Committee on Cancer
API:	Asian Pacific Islander
ASIR:	Age Standardised Incidence Rate
BCH	Bhaktapur Cancer Hospital
BPKMCH:	B P Koirala Memorial Cancer Hospital
CI:	Confidence Interval
CID:	Cancer Identification Number
CT:	Computed Tomography
DFS:	Disease Free Survival
GI:	Gastrointestinal
HDI:	Human Development Index
HICs:	High Income Countries
HR:	Hazard Rate
IARC:	International Agency for Research on Cancer
ICD:	International Classification of Disease
IHC:	Immunohistochemistry
JCGC:	Japanese Classification of Gastric Carcinoma
LMICs:	Low-and Middle-Income Countries

MDCT:	Multidetector Computed Tomography
MRI:	Magnetic Resonance Imaging
NHRC:	Nepal Health Research Council
NPR:	Nepalese Rupees
OR:	Odds Ratio
OS:	Overall Survival
PET-CT:	Positron Emission Tomography-Computed Tomography
RCT:	Randomized Controlled Trial
RR:	Relative Risk
SEER:	Surveillance Epidemiology and End Results
SES:	Socioeconomic Status
SIR:	Standardised Incidence Ratio
SPSS:	Statistical Package for the Social Sciences
SRC:	Signet Ring Cell
TNM:	Tumour Node Metastasis
UHC:	Universal Health Coverage
UICC:	International Union Against Cancer Classification
UTS:	University of Technology Sydney
WHO:	World Health Organization

Impact of COVID 19 pandemic on study

This PhD project was impacted by the COVID-19 pandemic and significant changes to the originally intended research were necessary. It was originally intended to deploy a case-control study design. This was intended to determine the comprehensive potential risk factors for gastric cancer in Nepal across a variety of risk factors (medical, biological and social) that are not fully researched within the Nepalese context. This process also included the collection of blood samples from 145 case participants at the B. P. Koirala Memorial Cancer Hospital and 290 matched control participants from the community. This would have required the researcher to go to Nepal. However, the researcher was unable to visit Nepal to gather any samples because the COVID 19 travel restrictions imposed on University of Technology Sydney (UTS). It was furthermore in this environment not possible to task local hospitals or health services with the collection of samples.

Based on the consultation with supervisors and experts in the field, it was decided to refocus the PhD as well as the associated methods to focus on survival analysis that would allow to effectively use secondary data that could be gathered by medical record employees at the Bhaktapur Cancer Hospital in Nepal. In addition to developing a new study design and receiving relevant ethics approvals from UTS and Nepalese authorities, the researcher was also required to recruit, train and manage the hospital medical record staff in Nepal and provide them with data collection scripts, data collection procedures and survey software questionnaires. These activities were essential to ensure the data was accurately collected and securely transferred to the UTS survey software.

For the first 20 months of the PhD candidature, the original case-control study design was maintained. Within 28 months, the new study design was developed, implemented, obtained ethical approval, data collected, data analysed and the thesis completed.