

ANTIBODIES TO HBV SURFACE ANTIGEN AS A PREDICTOR OF SURVIVAL IN HEMODIALYSIS PATIENTS - A PROSPECTIVE STUDY

Alicja E. Grzegorzewska¹, Monika K. Świderska², Wojciech Warchol³

1. Poznań University of Medical Sciences (PUMS), Department of Nephrology, Transplantology and Internal Diseases, Poznań, POLAND,
2. PUMS, Student Nephrology Research Group, Poznań, POLAND,
3. PUMS, Department of Biophysics, Poznan, POLAND.

Introduction:

Antibodies to HBV surface antigen (anti-HBs) in the titer of ≥ 10 U/L are the established marker of a protective response [1]. Resolution of HBV infection is also associated with development of anti-HBs [2].

Aim:

To investigate whether anti-HBs are an independent predictor of survival in hemodialysis (HD) patients free from HBV infection, and those infected with HBV in a 6-year prospective study.

Methods:

Study included 532 hemodialysis patients
Observation period: 30 January 2009 - 30 January 2015
Demographic, clinical, and laboratory characteristics, including anti-HBs titers, were used in survival analyses conducted using the Kaplan-Meier method and the Cox proportional hazard model.

Conclusions:

1. Ability to produce the protective anti-HBs titer in response to HBV vaccine is a positive predictor of survival in HBV non-infected HD patients.
2. Non-response is a risk factor for all-cause, CV, and possible infection- and neoplasm-related mortalities.
3. Absence of response to HBV vaccine is a surrogate marker of immune system disability what may contribute to multiorgan injury.

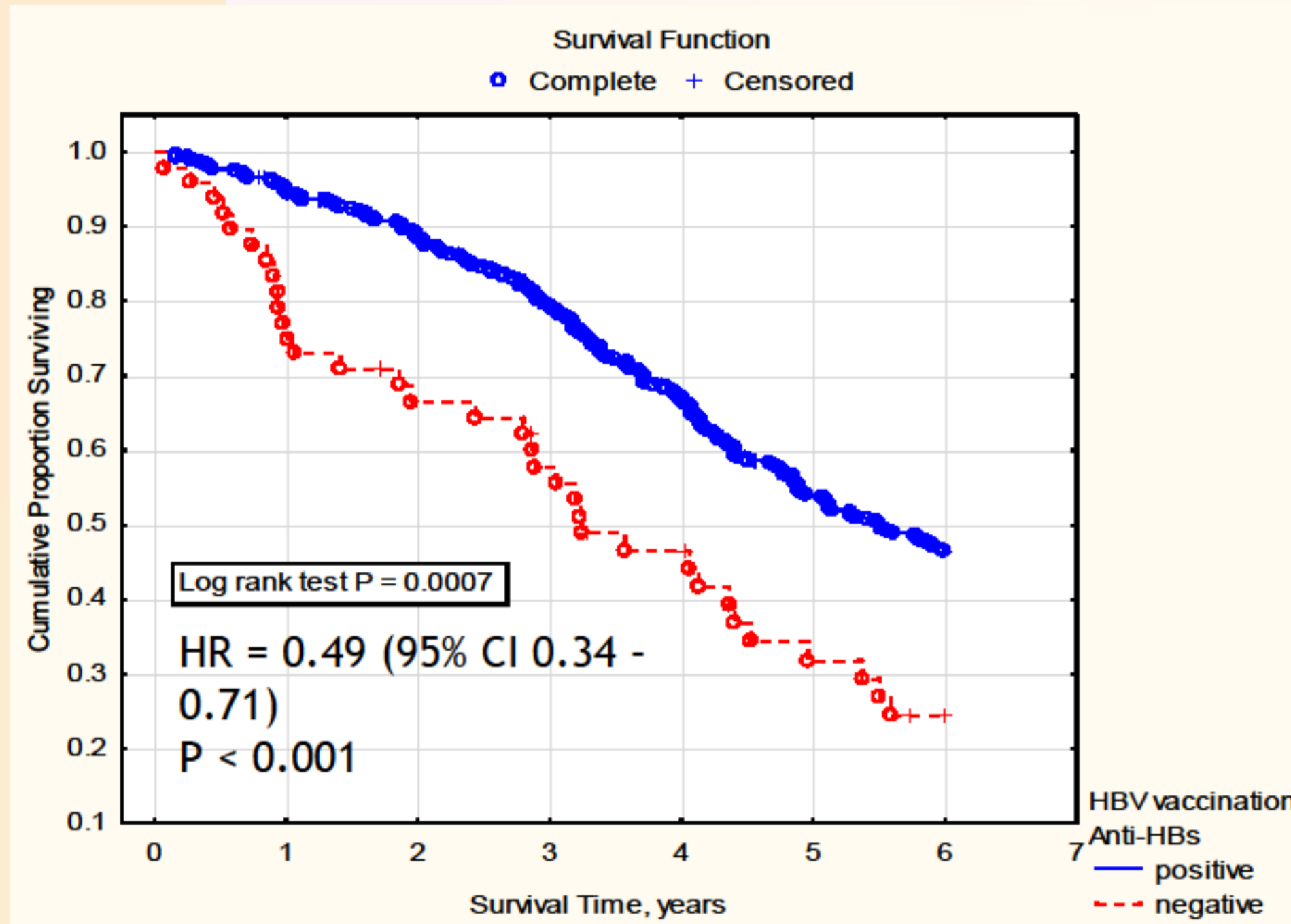


Fig. 2. The probability of survival in HBV non-infected HD patients who achieved positive anti-HBs titer before the enrolment into the study and HBV vaccinated patients with negative anti-HBs titer

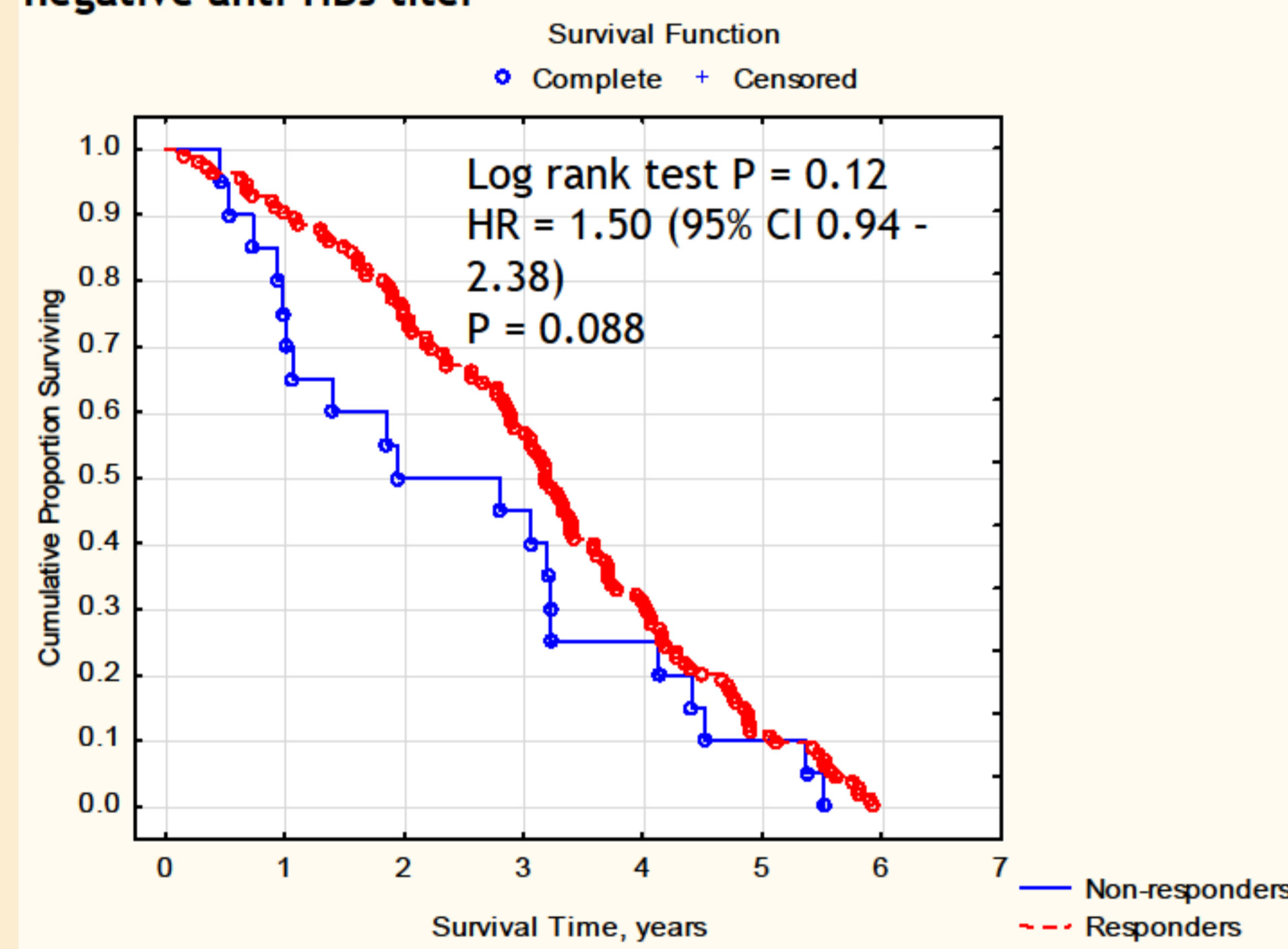


Fig. 3. Cardiovascular mortality in hemodialysis patients who responded or did not respond to hepatitis B vaccination

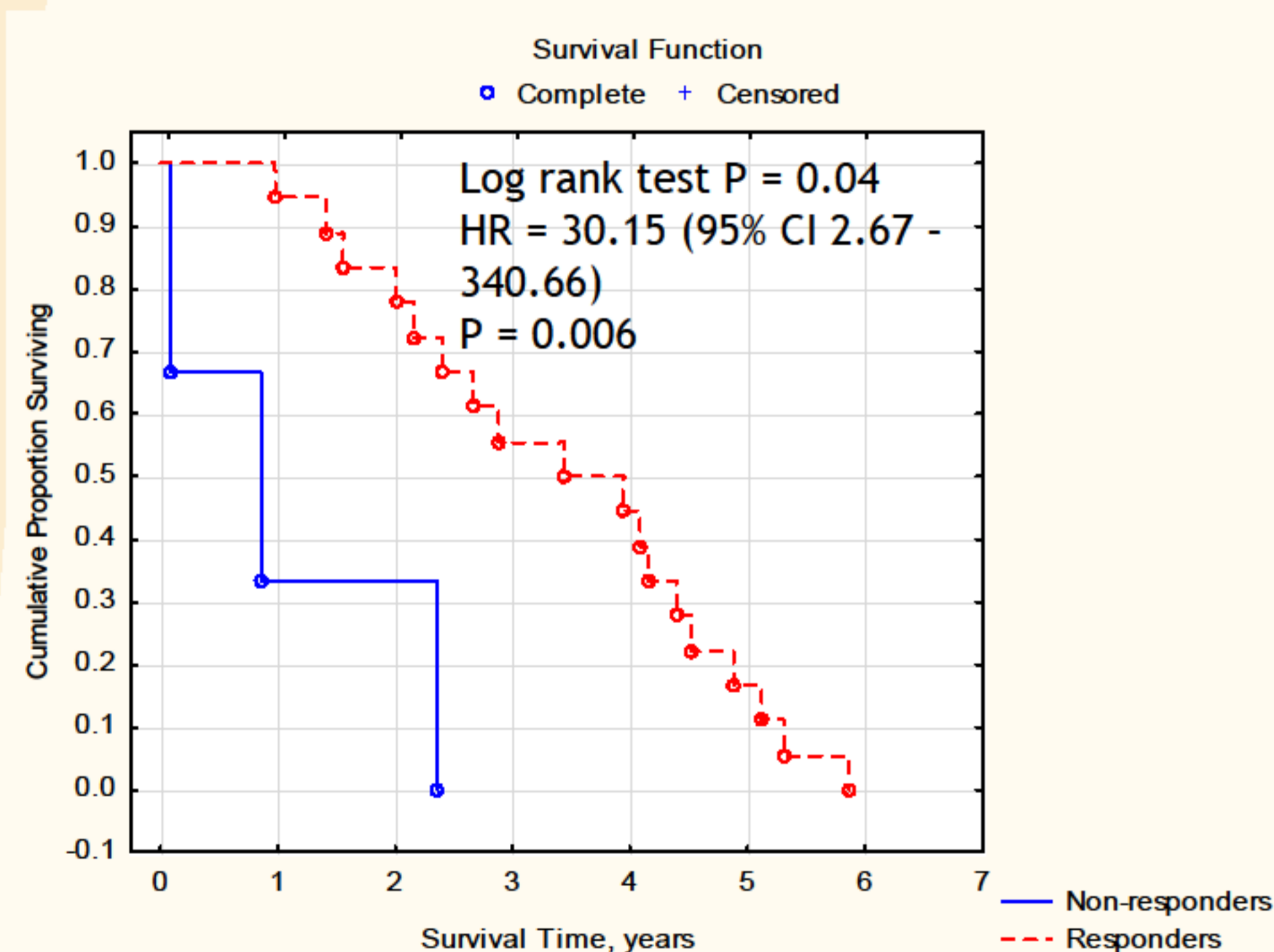


Fig. 4. Infection-cause mortality in hemodialysis patients who responded or did not respond to hepatitis B vaccination

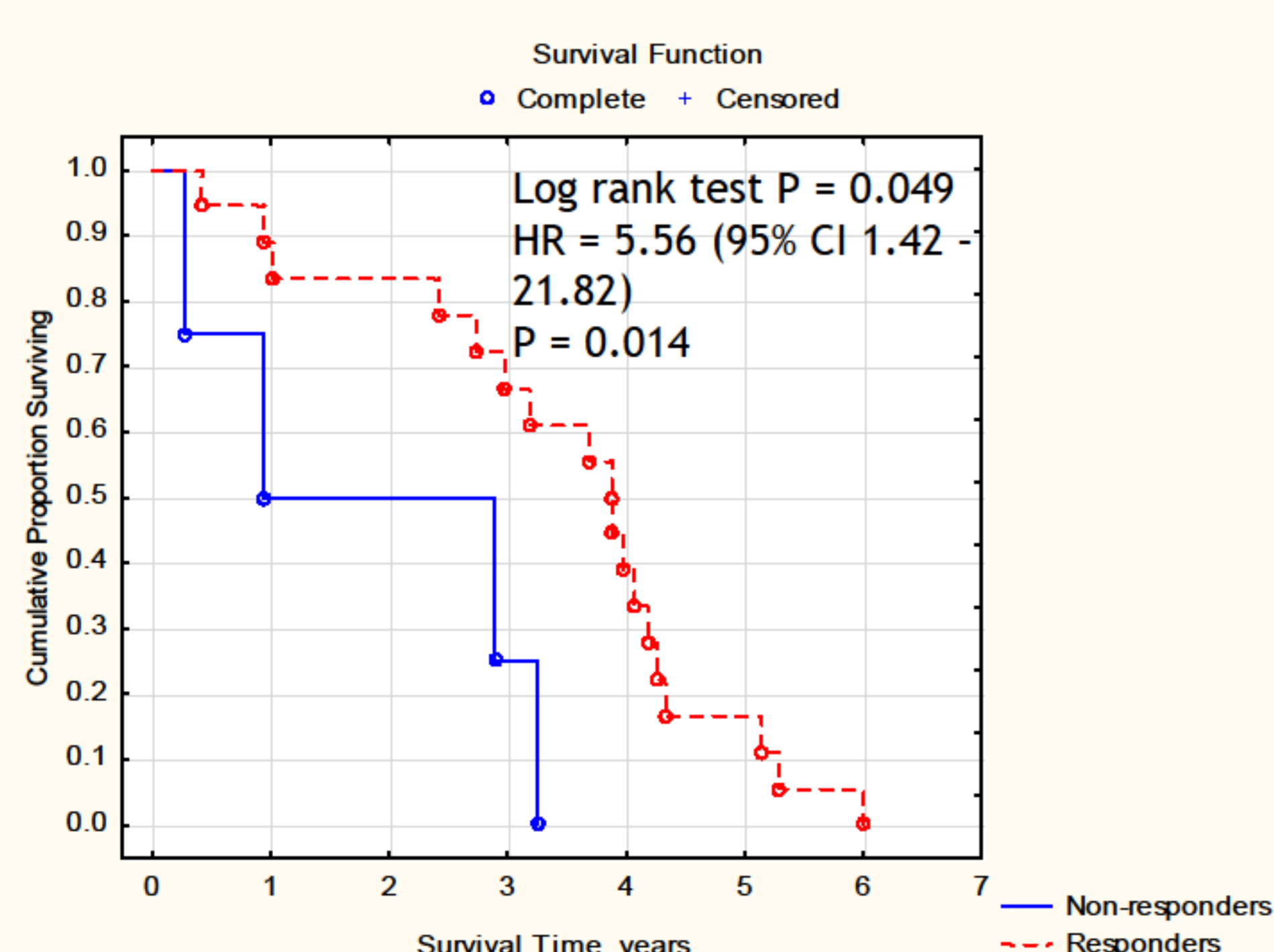


Fig. 5. Neoplasm-related mortality in hemodialysis patients who responded or did not respond to hepatitis B vaccination

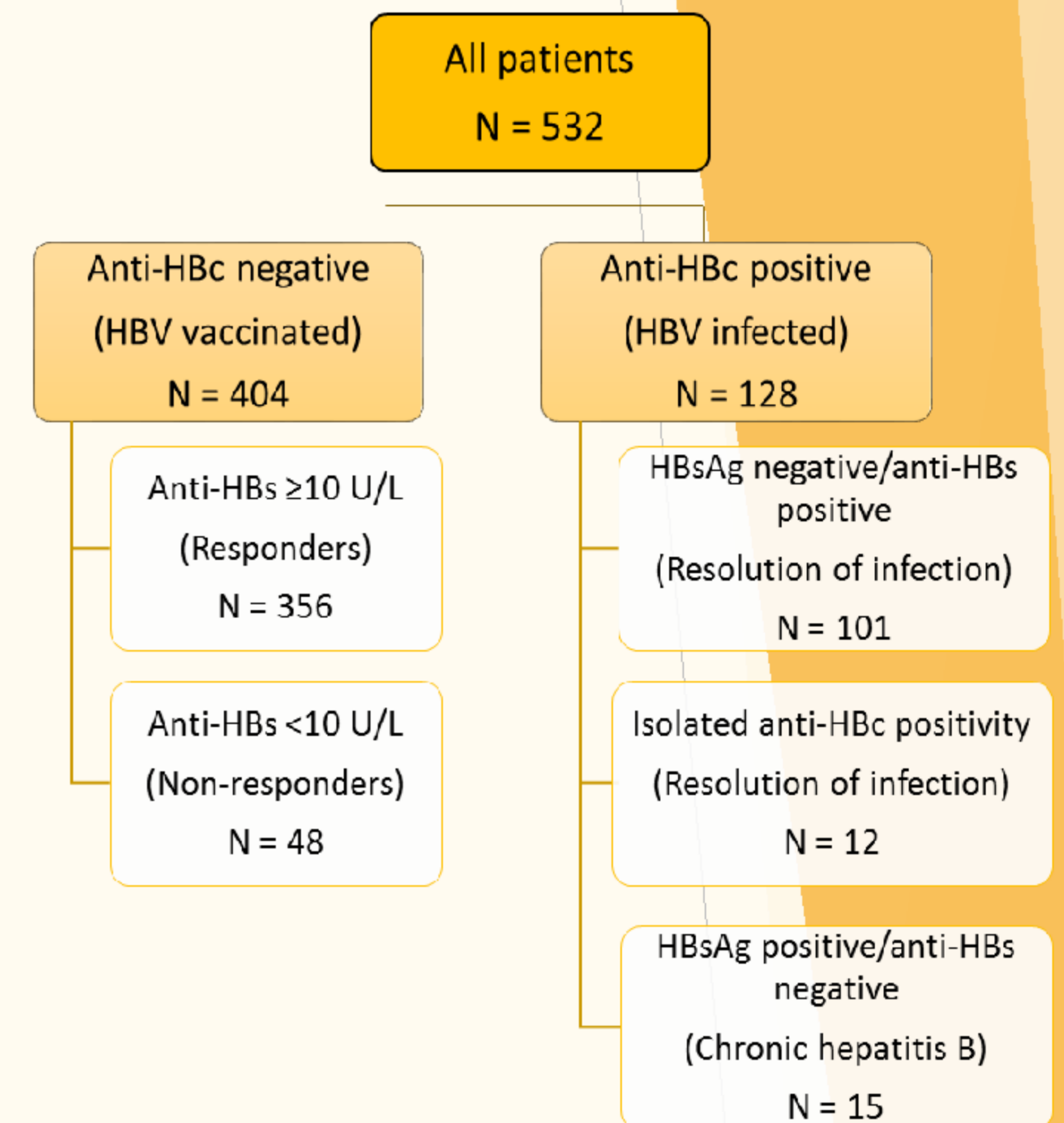


Fig. 1. The distribution of hemodialysis patients according to HBV serologic status

Variables that yielded significance in univariate analyses of survival (age, diabetic nephropathy, chronic glomerulonephritis, coronary artery disease, PTH, AST, anti-HBs) were used in multivariate analyses of survival.

	HBV non-infected patients	HBV infected patients
All-cause mortality:	A. Increasing age (HR 1.02, 95% CI 1.01 - 1.03, P = 0.005)	All-cause mortality:
	B. Coronary artery disease (HR 1.66, 95% CI 1.14 - 2.42, P = 0.002)	Cardiovascular mortality:
	C. Non-response to HBV vaccination (HR 1.59, 95% CI 1.19 - 2.13, P = 0.008)	Absence of anti-HBs (HR 1.78, 95% CI 1.02 - 3.08, P = 0.01).
		Coronary artery disease (HR 2.40, 95% CI 1.37 - 4.12, P = 0.002)
		Diabetic nephropathy (HR 2.86, 95% CI 1.15 - 7.12, P = 0.02)

Fig. 7. Variables independently associated with all-cause and cardiovascular mortality in HBV non-infected and infected HD patients

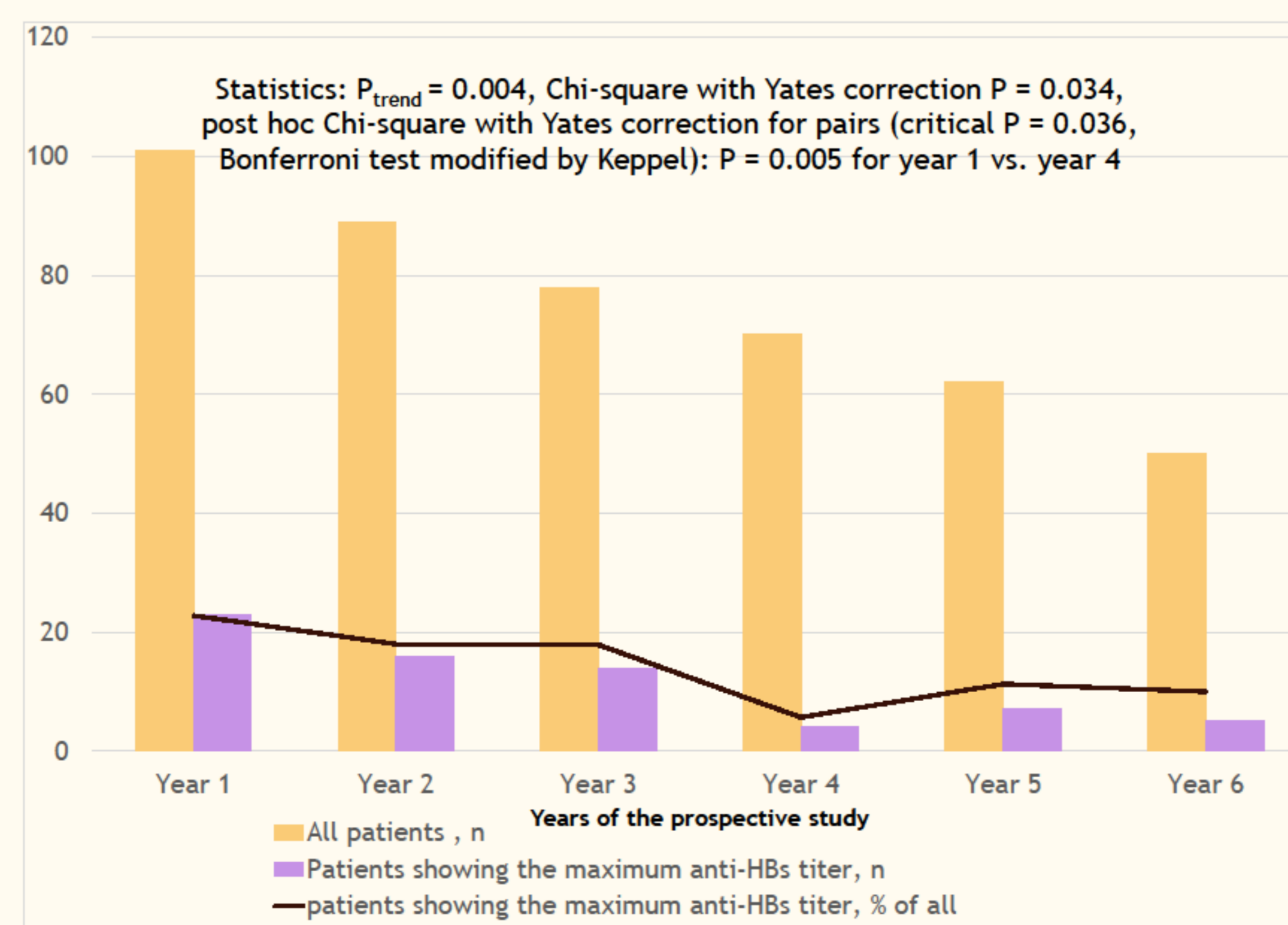


Fig. 6. Development of the maximum anti-HBs titer in HBV infected patients during the prospective study

Causes of death	Responders N = 356	Non-responders N = 48	P value
All, n, % of all	172 (48.3)	34 (70.3)	0.006
Cardiovascular, n, % of all	115 (32.3)	20 (41.7)	0.25
Cardiac, n, % of all	78 (21.9)	14 (29.2)	0.34
Sepsis/infection, n, % of all	18 (5.1)	3 (6.3)	0.99
Neoplasms, n, % of all	18 (5.1)	4 (8.3)	0.54
Rare/unknown, n, % of all	21 (5.9)	7 (14.6)	0.05

Table 1. Comparison of causes of death among responders and non-responders to HBV vaccine

[1] Schroth RJ, et al. Cochrane Database Syst Rev 2004;3:CD003775.

[2] Krajden M, et al. The Canadian Journal of Infectious Diseases & Medical Microbiology. 2005;16(2):65-72.