

ABSTRAK

Vaksinasi *Pneumococcal Conjugate Vaccine* (PCV) 10 dan 13 terbukti *cost effective* untuk mengurangi angka kejadian *pneumococcal diseases* (pneumonia, sepsis dan meningitis) di beberapa negara. Namun hingga saat ini vaksinasi PCV belum dimasukkan dalam program imunisasi wajib bagi anak di Indonesia. Tujuan dari penelitian ini adalah untuk menganalisis efektivitas biaya vaksinasi PCV-10 dan 13 pada anak di Daerah Istimewa Yogyakarta (DIY) dibandingkan dengan anak yang tidak mendapatkan vaksinasi.

Penelitian ini merupakan penelitian farmakoekonomi dengan metode *cost utility analysis* melalui pendekatan modeling menggunakan model *decision tree*. Model mengasumsikan setiap bayi yang baru lahir dilakukan vaksinasi PCV-10 atau 13 dan tidak dilakukan vaksinasi. Subyek penelitian ini adalah seluruh populasi pasien anak rawat inap yang terdiagnosis pneumonia, sepsis dan meningitis di 11 rumah sakit di DIY dari bulan September 2017 – Maret 2018 yang memenuhi kriteria inklusi dan eksklusi penelitian. Data *cost of illness* perawatan pasien diperoleh melalui data tagihan rumah sakit dan wawancara orang tua pasien. *Direct medical cost* vaksinasi PCV-10 dan 13 berdasarkan HET dan harga UNICEF, sedangkan *direct nonmedical cost* dan *indirect cost* vaksinasi PCV-10 dan 13 diperoleh melalui wawancara orang tua pasien. Utilitas dan status kesehatan VAS pasien diukur menggunakan instrumen EQ-5D-5L dengan *value set* Indonesia. Data efektivitas vaksin, probabilitas penyakit dan luaran penyakit diperoleh melalui data sekunder. Hasil penelitian berupa ICER (*Incremental Cost Effectiveness Analysis*) per QALYs (*Quality-Adjusted Life Years*). Nilai ICER yang diperoleh dilakukan analisis sensitivitas satu jalan dan probabilistik.

Dalam penelitian ini diperoleh 390 pasien pneumonia, 11 pasien meningitis dan 22 pasien sepsis. *Cost of illness* menurut perspektif *provider* dan *societal* perawatan pasien pneumonia dengan luaran penyakit sembuh dan meninggal adalah Rp7.986.706-10.902.024 dan Rp63.841.674-74.591.074; sepsis dengan luaran penyakit sembuh dan meninggal adalah Rp10.484.614-11.774.558 dan Rp144.294.282-158.232.627; meningitis dengan luaran penyakit sembuh, disabilitas, tuli dan meninggal adalah Rp25.147.864-29.337.121; Rp45.543.036-253.857.999; Rp133.472.550 dan Rp274.395.578. Biaya vaksinasi PCV-10 berdasar HET dan harga UNICEF sebesar Rp139.876-980.494, sedangkan PCV-13 sebesar Rp143.415-1.274.549. Utilitas dan status kesehatan VAS pasien pneumonia dengan luaran sembuh; sepsis dengan luaran sembuh; meningitis dengan luaran sembuh dan disabilitas berturut-turut adalah 0,67-67,66; 0,54-71,75; 0,78-55,00; -0,10-43,75. ICER vaksinasi PCV-10 dan PCV-13 menurut perspektif *societal* apabila menggunakan harga vaksin sebesar HET adalah Rp278.523.040 dan Rp370.172.987, sedangkan apabila menggunakan harga UNICEF sebesar Rp109.019.086 dan Rp110.756.615. Besaran 3 GDP (*Gross Domestic Product*) adalah Rp177.300.029, sehingga dapat disimpulkan bahwa vaksinasi PCV-10 dan PCV-13 tidak *cost effective* apabila harga vaksin menggunakan HET namun *cost effective* apabila menggunakan harga UNICEF.

Kata kunci: *cost utility analysis, pneumococcal conjugate vaccine, anak, Yogyakarta, Indonesia*

ABSTRACT

Pneumococcal Conjugate Vaccine (PCV) 10 and 13 have been proven to be cost-effective in reducing pneumococcal diseases. However, PCV vaccination has not been included in the immunization program in Indonesia. The purpose of this study was to analyze the cost-effectiveness of PCV-10 and 13 vaccination in children who got the vaccines compared to children who did not get the vaccines.

This study was a pharmacoeconomic study with a cost utility analysis method, using a modelling approach. The model would assumed that every newborn was vaccinated and was not vaccinated with PCV-10 or 13. The subjects were all pediatric patients who were hospitalised in 11 hospitals in Special Region of Yogyakarta from September, 2017–March, 2018 with diagnosis of pneumonia, sepsis or meningitis, that met the inclusion and exclusion criteria of this study. Data on cost of illness for patient care were obtained from hospital bills and interviews with the parents. The direct medical costs of the PCV-10 and 13 vaccinations were based on the highest retail prices and UNICEF prices while the direct non-medical costs and indirect costs of PCV-10 and 13 vaccination were obtained by interviews with the parents. Patient utility and health status by VAS was measured using the EQ-5D-5L instrument with the Indonesian value set. Data on vaccination effectiveness, disease and disease outcome probability were obtained through secondary data. The results were in the form of ICER (Incremental Cost Effectiveness Analysis) per QALYs (Quality-Adjusted Life Years). The ICER value was analyzed for one-way and probabilistic sensitivity.

This study involved 390 pneumonia patients, 11 meningitis patients and 22 sepsis patients. The cost of illness from provider and societal perspective for treatment of pneumonia patients, with the outcomes of 'recovered' and 'died' were IDR7,986,706-10,902,024 and IDR63,841,674-74,591,074 respectively; for treatment of sepsis patients with the outcomes of 'recovered' and 'died' were IDR10,484,614-11,774,558 and IDR144,294,282-158,232,627 respectively; and for treatment of meningitis patients with the outcomes of 'recovered', 'disabled', 'deaf' and 'died' were IDR25,147,864-29,337,121, IDR45,543,036-253,857,999, IDR133,472,550 and IDR274,395,578, respectively. The costs of vaccination for PCV-10 using highest retail prices and UNICEF price were IDR139,876 and 980,494, respectively. The costs of vaccination for PCV-13 using highest retail prices and UNICEF price were IDR143,415 and 1,274,549, respectively. The patient utility and health status by VAS with the outcome 'recovered' for pneumonia, sepsis and meningitis patients were 0.67-67.66; 0.54-71.75; 0.78-55.00, respectively; while the patient utility with the outcome 'disabled' for meningitis patients were -0.10-43.75, respectively. ICER vaccinations for PCV-10 and PCV-13 from societal perspective using highest retail prices were IDR278,523,040 and IDR370,172,987, respectively. While using UNICEF prices were IDR109.019.086 and IDR110.756.615, respectively. It could be concluded that the PCV-10 and PCV-13 vaccinations were not cost-effective when using highest retail prices but they were cost-effective when using UNICEF prices.

Keywords: cost utility analysis, pneumococcal conjugate vaccine, children, Indonesia