

REVIEW ARTICLE

A Review on The Current Burden of Catastrophic Health Expenditure from Major Illnesses in Malaysia

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ABSTRACT

Several illnesses continue to generate disproportionate financial burdens for Malaysian households despite a subsidised health system. This review synthesised 12 studies published between 2020 and 2025 that reported catastrophic health expenditure (CHE) associated with chronic and infectious diseases. National surveys showed low CHE prevalence (2–3%), yet disease-specific studies reported much higher rates: 15%–87% in cancer patients, 24% in kidney transplant recipients, 38%–80% in malaria (depending on CHE threshold), and 2% in adult asthma patients. Key drivers included low income, treatment intensity (chemotherapy, radiotherapy, transplant), absence of financial aid or Guarantee Letters, and sociodemographic vulnerabilities such as small or female-headed households, rural residence, and minority ethnicity. Non-medical and indirect costs, particularly transport and productivity loss, contributed substantially but were often under-measured. These findings highlight persistent gaps in financial protection, underscoring the need to expand coverage for non-medical costs, address inequities, and systematically integrate productivity loss into CHE monitoring to advance universal health coverage and safeguard household financial stability in Malaysia.

INTRODUCTION

Health economics provides a way to assess



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how resources are mobilized, allocated, and used within a health system to improve population health. It reflects the core economic principles of scarcity, choice, and opportunity cost, emphasizing that resources are limited and selecting one option inevitably means forgoing others (Listl et al., 2019)

At the macroeconomic level, indicators focus on overall and per capita health expenditure, the mix of public and private spending, reliance on external support, and the distribution of resources across levels of care (WHO, 2010). Health indicators also link health spending to health outcomes, such as improvements in life expectancy, maternal and child health, or reduce disease burden (Anwar et al., 2023). At the household level, financial protection is often measured through out-of-pocket (OOP) payments, the occurrence of catastrophic health expenditure (CHE), and whether medical costs drive families into poverty (Xu et al., 2003). Catastrophic out-of-pocket spending is deemed an indicator for monitoring Universal Health Coverage (UHC) financial protection, and its prevention is a key goal of health policy (Wagstaff et al., 2018).

Protecting families from financial ruin should be understood within a broader welfare economics perspective, where the goal is to address market failures, promote equity, and ensure that the distribution of health system benefits and burdens is socially just (Jack, 2000). Therefore, CHE measurement provides the evidence of vulnerability, while welfare economics summons the rationale for policy action.

In this sense, governments must raise and manage sufficient resources through taxation, insurance, or innovative financing to ensure that access to services is based on need rather than ability to pay (WHO, 2010). Strengthening financial protection is central to the pursuit of UHC and directly supports Sustainable Development Goal (SDG) 3.8, which calls for access to essential health

services and financial risk protection for all (United Nations, 2015).

Malaysia has a dual-tier health system, with a heavily subsidized public sector and a growing private sector (Jaafar et al., 2013). Overall financing is slightly progressive, with a Kakwani index of 0.186, supported mainly by direct taxes, insurance premiums, and contributions to Employees' Provident Fund (EPF) and Social Security Organization (SOCSO), while indirect taxes were regressive (Yu et al., 2008). Out-of-pocket payments, however, remain the most regressive form of financing, as they depend on need at the point of service and often push poorer households into catastrophic or impoverishing spending (Wagstaff et al., 2018). The public sector follows a structured policy framework, but the private sector relies on out-of-pocket payments, private insurance, and savings, operating with less regulation, fragmented data sharing, and systemic disparities (Chua & Cheah, 2011).

Catastrophic health expenditure is measured either when out-of-pocket payments exceed a fixed share of total household income or expenditure (10% or 25%; budget share approach), or when they surpass a household's remaining resources after meeting basic needs (25% or 40%; capacity-to-pay approach) (Nguyen et al., 2023).

Chronic, debilitating illnesses such as cancer and other major communicable or non-communicable diseases (NCD) often lead to CHE. Evidence from China shows that the overall CHE rate reached 25.2% between 2000 and 2020 and continued to rise, particularly among low-income households, the elderly, and those with major conditions such as cancer, chronic kidney disease, and cardio-cerebrovascular diseases (Zhang et al., 2023). In high-income settings such as South Korea, the presence of a comprehensive social health insurance system has helped reduce the financial impact of catastrophic illnesses, yet CHE remains a concern with around 3.5% of

households still affected, particularly among the poor and those with chronic conditions (Choi et al., 2015).

This review fills an important evidence gap, as no recent synthesis has systematically compared national CHE estimates with disease specific financial burdens in Malaysia. By consolidating fragmented evidence across major illnesses, this review informs policy on financial risk protection, highlights populations inadequately captured by routine UHC indicators, and supports more targeted interventions to reduce catastrophic spending.

MATERIALS AND METHODS

This review was conducted as a narrative synthesis of literature on catastrophic illness and CHE in Malaysia. The search covered PubMed and Scopus for studies published between 2020 and 2025, using keywords such as catastrophic health expenditure, out-of-pocket spending, household financial burden, and Malaysia. Additional sources included reference lists of relevant articles and grey literature such as Ministry of Health and World Health Organization reports.

Eligibility Criteria

Studies were included if they reported household-level economic outcomes (out-of-pocket costs, catastrophic health expenditure, impoverishment, or indirect costs) among Malaysian populations affected by any chronic illnesses.

Data extraction and synthesis

From each study, data were extracted on author and year, study design, population, disease focus, sample size, CHE threshold, CHE prevalence, and major cost components. Findings were then synthesized thematically into four domains: National CHE levels, disease-specific CHE, indirect and non-medical costs, and determinants of CHE.

RESULTS

A total of 12 studies (Table 1) is included in this review, representing diverse illnesses in Malaysia including cancers, chronic non-communicable diseases, infectious diseases, and general household surveys, with sample sizes ranging from just over 100 patients to more than 13,000 households.

National CHE levels

Two studies using national Household Expenditure Survey (HES) data reported low overall CHE prevalence among Malaysian households. The incidence of CHE ranged between 1.7% and 2.8% at the 10% income threshold (Samsudin et al., 2022). These national-level figures suggest that the majority of Malaysian households are protected from catastrophic out-of-pocket payments under the universal health coverage system. However, these aggregate estimates mask substantial variation when CHE is examined in disease-specific populations.

Disease-specific CHE

Disease-specific analyses revealed far higher CHE burdens than national averages (Table 2). Cancer accounted for the most severe financial impact, with CHE prevalence ranging from 15% to as high as 87% depending on cancer site, stage, and threshold applied (Raman et al., 2022; Wan Puteh et al., 2023). Oral cancer patients experienced the highest burden (87%), followed by gynaecological cancers (64%), and multi-centre oncology cohorts (26%–54%). For kidney transplant recipients, CHE prevalence was moderate (24%), while asthma patients in public primary care clinics reported only 1.7% CHE (Hussein et al., 2024). Malaria cases in Sabah showed 38%–80% of households exceeding CHE thresholds, reflecting a substantial impact from infectious disease (Abraham et al., 2025). Collectively, these findings demonstrate that national CHE statistics substantially underestimate the financial risks faced by households managing major illnesses.

Table 1: Characteristics of Included Studies

Author, Year	Disease Focus	Study Design	Sample Size	CHE Threshold	Key Findings	Setting / Location
Abraham et al., 2025	Malaria (P. knowlesi, P. falciparum, P. vivax, P. malariae)	Cross-sectional	152 cases	OOP above 10% and 25% monthly income	80% had >10% costs, 38% >25%. P. vivax most costly. Main burden productivity loss (58%).	4 hospitals in Sabah
Aminuddin et al., 2025	Cancer (all types, lower-income households)	Cross-sectional survey	430 patients	OOP more than 10% total household expenditure; 25% and 40% of non-food expenditure	Avg. OOP ~MYR 4,400–5,700. CHE: 67% (10%), 49% (25%), 33% (40%). Poverty headcount increased 11% post OOP.	6 referral cancer centres (4 Peninsular + 1 Sabah + 1 Sarawak)
Gan Kim Soon et al., 2023	Kidney transplant recipients (post-transplant care)	Cross-sectional	409 recipients	OOP more than 10% household income in 4 weeks preceding survey	24% CHE, mostly in middle (M40) and lower income (B40) group; 2.8 times and 3.1 times respectively, more susceptible to CHE compared to higher-income groups.	6 public hospitals, Klang Valley
Hussein et al., 2024	Adult asthma (outpatient care)	Cross-sectional	1003 patients	OOP more than 10% of monthly household income	CHE 2%, impoverishment 0.3%. Significant predictor of CHE was household income.	6 public health clinics, Klang District
Liew et al., 2022	Gynaecological cancers (ovarian, cervical, endometrial)	Cross-sectional	120 patients	OOP more than 10% of annual household income	64% CHE, 17% impoverished. Low income and chemotherapy are associated with higher risk.	UMMC, Kuala Lumpur
Raman et al., 2022	Oral cancer & oral potentially malignant disorders (OPMD)	Cross-sectional	104 patients	OOP more than 10% total annual household income	CHE: 87% (oral cancer), 19% (OPMD). Significant predictors were Indian ethnicity (aOR 6.24) & low-income (<USD 2722, aOR 14.32).	HTAR Klang & Sarawak General Hospital
Samsudin et al., 2022	Low-income households (B40)	Cross-sectional	6,720 households	OOP more than 10% total monthly income	CHE incidence 2%. Risks: small HH, elderly, hospitalisation. Protective: employed head household (HHH), child ≤5 yrs.	National Household Expenditure Survey (HES) (2016)
Sayuti & Sukeri, 2022	General households	Cross-sectional	13,015 households	OOP more than 10% annual total household consumption	CHE prevalence 3%. Significantly associated with female-led, rural, small household (HH), HHH <60 yrs.	National HES 2015/16
Ting et al., 2020	Urologic cancers (prostate, bladder, renal)	Cross-sectional	429 patients	OOP equal or more than 40% of HH capacity to pay	16% objective financial toxicity (CHE), 47% subjective financial toxicity. CHE were associated with private hospital use.	Sarawak General Hospital (public) & Subang Jaya Medical Centre (private)

Wan Puteh et al., 2023	Cancer (all types)	Cross-sectional	630 patients	More than 10% monthly household expenditure	CHE prevalence 54%. Higher in Indian, low education, unemployed, rural, poor income, small HH, far from hospital, radiotherapy, frequent visits, no GL. Predictors: low income (aOR 18.6), middle income (aOR 4.7), poverty income (aOR 4.7), far from hospital (aOR 2.6), chemo (aOR 3.7), radiotherapy (aOR 3.0), combo therapy (aOR 5.0), health insurance (aOR 4.0), no GL (aOR 3.4), no financial aid (aOR 2.9).	National Cancer Institute, Hospital Kuala Lumpur, Hospital Canselor Tunku Mukhriz
Wan Puteh et al., 2024	Cancer (all types)	Cross-sectional	206 patients	OOP more than 10% monthly household income	CHE prevalence 26%. Higher in Indian ethnicity, single, poverty income, small HH, no GL. Predictors: poverty income (aOR 5.6), near hospital (aOR 4.1), small HH (aOR 4.6), no GL (aOR 3.2).	National Cancer Institute
Kamarul Zaman et al., 2025	Cancer (all types)	Cross-sectional	209 patients	OOP more than 10% household income	CHE 15%. Predictors: non-Malay (AOR 6.6), lower education (AOR 9.6), no GL (AOR 4.8), unemployed HHH (AOR 6.5).	Universiti Sains Malaysia, Kelantan

Table 2: CHE Burden by Major Illness in Malaysia

Illness Category	No. of Studies	CHE Range Reported	Main Drivers of Cost	Notes / Comparisons
Cancer (all types and subtypes)	8 (Liew et al., 2022; Aminuddin et al., 2025; Ting et al, 2019; Raman et al., 2022; Kamarul et al., 2025; Wan Puteh et al., 2023; Wan Puteh et al., 2024; Gan Kim Soon et al., 2023)	15% – 87% depending on cancer type and threshold used	Chemotherapy, radiotherapy, advanced stage care, transport, supplements, non-medical costs, lack of GL/insurance	Consistently highest CHE across all illnesses. Oral cancer (86.5%) and gynaecological (64%) among the worst. National Cancer Institute studies (Wan Puteh) report ~26%–54%.
Chronic Disease	1 (Hussein et al., 2024)	2%	Transport, complementary & alternative medicine	Public primary care clinics protective; very low CHE compared to cancer.
Organ Transplant	1 (Gan Kim Soon et al., 2023)	24%	Anti-rejection medication, follow-up transport, OOP despite subsidies	Middle and low-income groups heavily affected. MOE hospitals less protected than MOH hospitals.
Infectious Disease	1 (Abraham et al., 2025)	38% – 80% (depending on threshold >10% vs >25%)	Productivity loss (58%), transport, hospital admission	P. vivax most costly. Rural, working-age men most affected.

General Households (National Surveys)	2 (Sayuti & Sukeri, 2022; Samsudin et al., 2022)	2% – 3%	Hospitalisation, elderly household members, rural setting	General population CHE is low. Disease-specific studies show much higher CHE than national averages.
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Table 3: Indirect and Non-Medical Cost Comparison

Study	Non-Medical Cost Amount	Total OOP Amount	Non-medical Share of Total OOP	Indirect Cost Amount	Indirect Share of Total	Notes
Aminuddin et al., 2025	MYR 3,444 (early), MYR 3,889 (late)	MYR 4,389 (early), MYR 5,692	78.5% (early), 68.3% (late)	Not captured	Not captured	Non-medical includes transport, accommodation, supplements, childcare, alternative treatments
Liew et al., 2022	Shares: CAM 14.1%, vitamins 12.6%, transport 9.7%, food 2.3%, parking 1.0%, accommodation 0.9%, devices 0.9%, nursing home 0.5%, other 0.2%	USD 2,780 mean per year	Multiple category shares reported, partial sum $\approx$ 42%+	Not captured	Not captured	Direct non-medical definition includes transport, accommodation, food, CAM, OTC, vitamins, devices, homecare
Abraham et al., 2025	Travel 8% of total episode	Composition by category reported as percentages	Travel 8% of total cost	Lost productivity for patients and caregivers	58% of total cost	Direct costs 41% of total, hospital admission 20%
Wan Puteh et al., 2023	Not itemized	Mean monthly total USD 134, direct USD 61, indirect USD 50	Not captured	USD 50 per month (mean)	37.3% of monthly total	Means in USD
Hussein et al., 2024	Transport main direct non-medical cost, CAM mean monthly OOP MYR 8.43	Not captured	Not captured	Not captured	Not captured	CHE also reported including and excluding transport
Kamarul Zaman et al., 2025	Monthly direct non-medical expenditures: Mean RM 121.9 (range 1.3–885)	Monthly direct medical expenditures: Mean RM 178.8 (range 0–4383.3)	$\sim$ 40.5% of total direct expenditures ($121.9 \div (178.8+121.9)$)	Annual loss of income: Mean RM 7,647.5 (range 375–24,000, n=22)	Indirect cost > direct costs ($\approx$ 3–4 $\times$ higher annually than monthly OOP)	Household income median RM 4,000; productivity losses only measured in a sub-sample (n=22).

Table 4: Determinants of CHE in Malaysia

Study	Significant Predictors	Notes
Abraham et al., 2025	P. vivax cases' mean episode cost USD 199 vs USD119 for P. knowlesi and P. falciparum	Productivity losses accounted for 58% of cost
Aminuddin et al., 2025	Advanced stages III and IV (p = 0.006) at 40%, colorectal cancer (aOR 2.1) at 10%, Chinese (aOR 0.4) at 10%, larger HH size (aOR 0.1) at 40%	Non-medical > medical costs
Gan Kim Soon et al., 2023	Middle income (aOR 3.1, p = 0.005), Bottom income (aOR 2.8, p = 0.002) vs top income	Income gradient clear
Hussein et al., 2024	Single most significant predictor of CHE was household income. Higher income quintile (aOR 0.08), lower income quintile (aOR 0.14)	Driven by transport costs
Liew et al., 2022	M40 households (aOR 0.23). T20 (aOR 0.05); no chemotherapy (aOR 0.16)	Both strong predictors of CHE
Raman et al., 2022	Oral cancer vs OPMD (CHE: 86.5% vs 19.2%); Indian ethnicity (aOR 6.3); monthly income <USD 2,722 (aOR 14.3)	Ethnic inequity

Samsudin et al., 2022	HH <4 (aOR 2.0), presence of elderly member (aOR 1.9), hospitalisation (aOR 2.4), having accident/medical insurance (aOR 4.1); Protective: employed HH head (aOR 0.4), have child ≤5 years old (aOR 0.4)	CHE incidence 1.7%
Sayuti & Sukeri, 2022	Female-headed HH (aOR 1.6), HH in rural (aOR 1.3), small HH size (aOR 2.4), HHH <60 years old (aOR 2.3)	Population CHE prevalence 2.8%
Ting et al., 2020	Objective FT: private hospital treatment (aOR 258.1), Chemo/RT (aOR 6.5), alternative medicine (aOR 7.25), paying with own savings/assets (aOR 13.9); Subjective FT: female (aOR 44.9), monthly income <RM5,000 (aOR 9.3), monthly income RM5,000-10,000 (aOR 4.5)	Objective FT (CHE) 16%, subjective FT 35%
Wan Puteh et al., 2023	Low income (aOR 18.6), middle income (aOR 4.7), poverty-line income (aOR 4.7), distance far (aOR 2.6), chemo (aOR 3.7), RT (aOR 3.0), combo therapy (aOR 5.0), health insurance (aOR 4.0), no GL (aOR 3.4), no financial aid (aOR 2.9)	Wide range of treatment & socio-demographic factors
Wan Puteh et al., 2024	Poverty income (aOR 5.6), living near hospital (aOR 4.1), small HH (aOR 4.6), no GL (aOR 3.2)	Counterintuitive "near hospital" effect
Kamarul Zaman et al., 2025	Non-Malay ethnicity (aOR 6.6), low education (aOR 9.6), no GL (aOR 4.8), unemployed HHH (aOR 6.5)	Wide range of treatment & socio-demographic factors

Table 5: Terms and Definitions

Term	Definition
Direct medical cost	Direct costs include all medical and non-medical expenditures directly linked to illness. Medical costs cover diagnosis, treatment, rehabilitation and related healthcare services. Examples: Hospital inpatient care, medications, diagnostic tests. Non-medical costs involve resource use outside the healthcare system such as transport, household expenses, relocation, property-related losses and informal caregiving. Examples: Transportation costs, childcare or housekeeping, legal or administrative costs related to the condition. (Jo, 2014)
Indirect medical cost	Indirect costs refer to productivity losses arising from morbidity or premature mortality. These losses are borne by individuals, families, employers or society through reduced work capacity or time away from usual activities. They represent part of the broader social welfare loss associated with illness. Examples: Productivity loss from morbidity, income loss from job absenteeism, time lost by family members or caregivers. (Jo, 2014)
Out of pocket	From cash on hand : with one's own money rather than with money from another source (such as an insurance company) (Merriam-Webster, n.d.). Used about money that you have to spend yourself rather than having it paid for you, for example by your employer or insurance company (Cambridge University Press, n.d.).
Expenditure	The total amount of money that a government or person spends (Cambridge University Press, n.d.)
Spending	The money that is used for a particular purpose, especially by a government, organization, or group (Cambridge University Press, n.d.)
Out of pocket cost	Cost; the amount or equivalent paid or charged for something (Merriam-Webster, n.d.). The amount of money a patient pays for medical expenses that are not covered by a health insurance plan. Out-of-pocket costs include deductibles, coinsurance, copayments, and costs for noncovered health care services (National Cancer Institute, n.d.).
Out of pocket payment	Payment; the act of paying (Merriam-Webster, n.d.). A direct payment for healthcare goods and services from the household primary income or savings, where the payment is made by the user at the time of the purchase of goods or the use of the services (Eurostat, n.d.).

Indirect costs

Across the included studies, indirect and non-medical costs emerged as substantial contributors to household financial burden (Table 3). In the Klang outpatient asthma cohort, Hussein et al. (2024) showed that although CHE incidence was low, expenditures were dominated by transport and the use of complementary and alternative medicine (CAM), which averaged MYR 8.43 per month. Similarly, Wan Puteh et al. (2023) reported that among cancer patients at the National Cancer Institute, indirect costs accounted for 37% of mean monthly health expenditure (USD 50 of USD 134), nearly equalling direct medical spending. For infectious disease, Abraham et al. (2025) found that productivity loss contributed 58% of total malaria episode costs, overshadowing direct medical payments, with travel alone accounting for 8%. In cancer care, Aminuddin et al. (2025) demonstrated that non-medical costs such as transport, supplements, and accommodation averaged MYR 3,444–3,889, representing 68–79% of total out-of-pocket spending, a share larger than direct medical expenses. Likewise, Liew et al. (2022) showed that non-medical categories including CAM (14.1%), vitamins (12.6%), and transport (9.7%) together exceeded 40% of all out-of-pocket spending for gynaecological cancer patients. Collectively, these findings indicate that transport, supplements, CAM, and productivity losses constitute a major portion of household financial hardship in Malaysia, often surpassing direct treatment costs.

Determinants of CHE in Malaysia

Multiple socioeconomic and clinical factors were identified as significant predictors of CHE (Table 4). Household income consistently emerged as the strongest determinant. Cancer and transplant studies demonstrated a clear income gradient, where patients from low- and middle-income groups had markedly higher odds of CHE compared with higher-income households (Gan Kim Soon et al., 2023; Wan Puteh et al., 2023; Liew et al., 2022). In

some studies, the effect size was large, with low-income cancer households showing up to an eighteen-fold increased risk (Wan Puteh et al., 2023).

Clinical and treatment-related factors were also important. Advanced disease stages, intensive modalities such as chemotherapy or radiotherapy, and the use of complementary or alternative medicine were consistently linked to higher CHE risk (Aminuddin et al., 2025; Ting et al., 2019; Wan Puteh et al., 2023). For oral cancer, CHE prevalence reached 86.5% compared to 19.2% among patients with oral potentially malignant disorders, highlighting the impact of disease severity (Raman et al., 2022).

Sociodemographic predictors showed variation across settings. Female-headed households, rural residence, smaller household size, and the presence of elderly members were associated with higher CHE in national surveys (Sayuti & Sukeri, 2022; Samsudin et al., 2022). Ethnicity, education, and employment status were significant in hospital-based studies; for example, non-Malay ethnicity (aOR 6.6), low education (aOR 9.6), and unemployment (aOR 6.5) were independent predictors in Kamarul Zaman et al. (2025).

Health financing arrangements also played a central role. The absence of a government Guarantee Letter or financial aid consistently predicted higher CHE (Wan Puteh et al., 2023; Wan Puteh et al., 2024; Kamarul Zaman et al., 2025). Even patients with private health insurance were paradoxically more likely to face CHE, possibly reflecting higher service utilisation and treatment intensity (Wan Puteh et al., 2023).

Finally, studies of infectious diseases underscored the influence of disease type and productivity losses. In Sabah, malaria due to *P. vivax* generated higher costs than other species, and lost income accounted for more than half of the household burden

(Abraham et al., 2025). In asthma, the primary driver of CHE was not medical treatment but transport costs, again illustrating how non-medical expenditures can determine financial vulnerability (Hussein et al., 2024).

DISCUSSION

This review highlights a stark contrast between national estimates of CHE and the financial reality faced by households affected by major illnesses in Malaysia.

CHE Pattern in Malaysia

Earlier studies that examined CHE in Malaysia were relatively low, 1.7% in 1998/99 and 2.0% in 2004/05 (Sayuti & Sukeri, 2022). However, the trend increases to 2.8% in the 2015/16 household expenditure data (Sayuti & Sukeri, 2022). Recent disease-specific studies in Malaysia confirm that cancer is the leading driver of catastrophic expenditure, with prevalence ranging from 15% to 87% depending on type and threshold. These findings are consistent with earlier work, where CHE prevalence among colorectal cancer patients was 47.8% (Azzani et al., 2017). Similarly, in terms of infectious disease, household CHE prevalence among rotavirus gastroenteritis cases requiring hospitalization was 33% (Loganathan et al., 2015), which is comparable to the 38%–80% CHE reported among malaria patients in Sabah (Abraham et al., 2025).

While national survey data reported low CHE prevalence of less than 3%, disease-specific studies consistently demonstrated much higher rates, particularly for cancer. Although Malaysia's tax-based health financing system has kept overall CHE prevalence relatively low at the population level, evidence over successive national surveys indicates that financial hardship from health spending has persisted and gradually increased over time, signalling unresolved gaps in effective financial protection (Sayuti & Sukeri, 2022). These findings indicate that

the national CHE indicators used to monitor Sustainable Development Goal (SDG) 3.8.2 may underestimate the extent of financial risk among patients with catastrophic illnesses.

The pattern observed in Malaysia is consistent with evidence from other middle-income countries, where the burden of CHE is concentrated in households managing severe and prolonged illnesses such as cancer. Regional data from Southeast Asia likewise report high financial vulnerability among cancer patients despite universal health coverage (ACTION Study Group, 2015). Malaysia was also included in the large ACTION Study Group (2015), which followed newly diagnosed cancer patients across eight countries and found that nearly 48% experienced financial catastrophe (out-of-pocket costs exceeding 30% of annual household income) within 12 months of diagnosis, with a further 29% dying within that year. The findings from this landmark study resonate clearly with more recent Malaysian evidence on the substantial CHE burden among cancer households.

Cancer and Major Illnesses as Persistent Drivers of CHE

The evidence across recent Malaysian studies makes clear that indirect and non-medical costs remain a dominant driver of catastrophic health expenditure. Even when direct medical services are heavily subsidised, households continue to face substantial financial strain from transport, nutritional supplements, complementary medicine, accommodation, and lost wages. For example, in a systematic review of non-communicable diseases across diverse countries, reported that out-of-pocket expenditures ranged from 2% to 158% of family income, and financial catastrophe due to NCDs occurred in 6% to 84% of households, reflecting the substantial economic burden posed by NCDs including indirect costs (Jaspers et al., 2015).

Determinants of CHE

The determinants of CHE in Malaysia reflect

a consistent pattern across disease areas. Low household income was the strongest and most consistent predictor, with some cancer households facing more than ten-fold higher risk. Treatment intensity including advanced stage, chemotherapy, radiotherapy, and use of complementary medicine substantially increased the likelihood of CHE. Sociodemographic vulnerabilities such as small household size, elderly dependents, female-headed households, and non-Malay ethnicity further heightened financial risk. Gaps in financial protection, particularly the absence of a government Guarantee Letter or social aid, were repeatedly associated with CHE, while even insured patients were not spared due to higher utilisation.

Methodological Considerations in CHE Measurement

Several methodological issues also warrant attention. Studies applied varying thresholds (10%, 25%, 40%), total income calculation (monthly household income, annual income), and differed in whether indirect costs were included, complicating direct comparisons. The exclusion of indirect costs likely leads to underestimation of CHE, while inclusion captures the full household financial burden but reduces comparability with international metrics (Wagstaff et al., 2018).

Equity Gaps Within a Subsidized Health System

While the national health system provides extensive subsidies for medical care, the reviewed studies point to areas where households remain financially vulnerable. Low-income groups continue to bear a disproportionate risk of CHE despite subsidies being in place. Much of this vulnerability arises from non-medical and indirect costs such as transport, accommodation, supplements, and income loss, which are not routinely covered by existing schemes. Several studies also identified the absence of a Guarantee Letter or financial aid as a key predictor of CHE, suggesting that administrative access

to these protections is uneven. In addition, sociodemographic factors including female-headed households, smaller household sizes, and certain ethnic groups were consistently linked to higher risk, reflecting inequities that persist within a subsidised system. Treatment intensity and private sector care also contributed substantially to financial burden. Only a minority of local CHE studies accounted for productivity losses (Abraham et al., 2025; Raman et al., 2022; Wan Puteh et al., 2024), with detailed estimates available. These studies showed that income loss can represent a major share of household burden, yet most CHE analyses remain limited to direct and non-medical costs. Collectively, these findings indicate that while Malaysia's financing arrangements protect against many direct medical costs, households still face significant financial pressure from broader illness-related expenses.

Policy Implications for Strengthening Financial Protection in Malaysia

The implications of these findings are significant for policy. Malaysia's progress towards UHC has been commendable, yet the persistence of high CHE among catastrophic illnesses signals gaps in protection. Based on the reviewed evidence, several recommendations emerge for strengthening financial protection in Malaysia. Expanding coverage for low-income households through targeted schemes such as Peka B40 and MySalam remains critical. Protection should also extend beyond direct medical expenses to include non-medical and indirect costs such as transport, accommodation, caregiver support, and wage loss, which were repeatedly shown to drive CHE. While existing initiatives such as PeKa B40 partially address this gap through transport assistance for eligible low-income patients, coverage remains limited in scope and does not extend to other major cost drivers such as income loss, accommodation, or long-term caregiving needs (ProtectHealth Corporation, n.d.). Equitable access to Guarantee Letters and financial aid must be ensured through

simplified administrative processes, while tailored support should be directed to vulnerable groups. Future CHE monitoring and research should systematically incorporate productivity loss to capture the full extent of household economic burden. Finally, financial protection measures should be always preceded by prevention, risk reduction, and access to affordable treatment for all illnesses; which can promote equitable access and reduce CHE, even in resource-limited settings (ACTION Study Group, 2017).

CONCLUSION

This review highlights that the burden of CHE in Malaysia remains substantial across major illnesses, with cancer, transplant, chronic disease, and prevalent infectious conditions imposing the heaviest strain. The evidence shows that low-income households, treatment intensity, and gaps in financial protection are consistent drivers of vulnerability. Addressing these factors is crucial to safeguard families against financial catastrophe, strengthen equity, and ensure that health resources are mobilised sustainably. Expanding financial protection to include non-medical and productivity costs will bring Malaysia closer to the goals of UHC and the welfare economics principle of protecting households from impoverishment.

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