Distributionally Weighted Benefit Transfer for Regulatory Analysis: Evidence from the OECD Chemicals Surveys

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Motivation and policy relevance

Regulatory agencies are increasingly asked to evaluate not only the aggregate benefits of environmental and health regulations but also who receives them. The U.K. Green Book requires distributionally weighted estimates alongside unweighted ones (HM Treasury, 2026), the 2023 revision of U.S. Circular A-4 allowed them before its rescission in 2025 (Fraas et al., 2025), and the EU VALESOR project, which supplies health values for chemicals regulation, has begun to examine distributional considerations (Herrera-Araujo and Kostopoulou, 2025). Yet agencies rarely value benefits with a survey of the affected population. They use benefit transfer, which carries estimates from study sites to a policy site and adjusts them for differences in mean income. That procedure is distribution-neutral by construction: nothing in it says how the benefit is distributed across households at the policy site, which is what a weighted estimate needs. Current practice offers little operational guidance for producing distributionally weighted values when benefits are transferred. This paper develops a simple framework that lets agencies produce them from information that valuation studies and household surveys already report.

The question has just become concrete. In October 2026 the OECD released the results of SWACHE, the Surveys on Willingness-to-pay to Avoid Chemicals-related negative Health Effects (OECD, 2026): 96 harmonized surveys, more than 116,000 respondents in 27 OECD countries and South Africa, values for ten health effects, and values transferred to every OECD member for use in the cost-benefit analysis of chemicals regulation. The report finds that willingness to pay rises with household income in every endpoint and that exposure is concentrated among low-income households, and it names weighted cost-benefit analysis as an avenue for further research. The transfer itself is evaluated at mean income, with no distributional adjustment. Our preliminary calculations show that weighting lowers these values by 5.5 to 17 percent across the countries examined, changes their ranking, and depends critically on which income elasticity is used.

Main contributions

As shown in Araña and León (2026), the social value of an improvement equals mean willingness to pay multiplied by a single statistic, the social value ratio R: the average welfare weight across households, each household weighted by its willingness to pay. With isoelastic welfare weights and lognormal income, R has a closed form in three quantities,

$$R = \exp\left(-\eta\, e\, \sigma^2\right),$$

where e is the income elasticity of willingness to pay, σ^2 the variance of log income, and η the inequality aversion that the analyst specifies. The paper turns this result into a tool for benefit transfer and makes three contributions.

1. **A welfare-consistent transfer factor.** The weighted value at the policy site is the income-adjusted transfer value that agencies already compute, multiplied by R evaluated at the policy site. The factor needs two

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published moments and one specified parameter: the elasticity, which transfer practice already estimates; the variance of log income, which household surveys and the OECD Income Distribution Database publish for any country; and the inequality aversion, which guidance can set, as the Green Book does at 1.3. No new surveys and no microdata are needed. The factor is distinct from the adjustment of mean willingness to pay for income inequality in recent structural transfer methods (Baumgärtner et al., 2017; Meya et al., 2021), and it is several times larger.

2. **Two elasticities, not one.** The elasticity that adjusts levels across countries and the elasticity that enters the welfare factor are different objects: the second measures how willingness to pay rises with income among households facing the same risk. Practice treats them as one parameter and gives it very different values. VALESOR transfers values across EU Member States with an elasticity of one with respect to GDP per capita (Herrera-Araujo et al., 2026); the OECD updates SWACHE values with 0.25; within the SWACHE samples the pooled elasticity for chronic kidney disease is about 0.2 (Dockins et al., 2024). Across the nine countries surveyed for that endpoint, the elasticity of mean willingness to pay with respect to mean disposable income is -0.22. Using it in the welfare factor would not merely overstate the correction; it would reverse its sign.

3. **An application to the OECD chemicals values.** The paper computes weighted values for the SWACHE endpoints and countries, both for the surveyed countries and for those reached by transfer, and reports them alongside the official unweighted values.

Data and preliminary results

The application combines the public SWACHE values by country and endpoint (2023 PPP dollars), the within-sample income elasticities reported in the endpoint studies, and the Gini coefficient of disposable income from the OECD Income Distribution Database. Table 1 applies the factor to chronic kidney disease, surveyed in nine countries, with $e = 0.2$ and η of 1 and 1.3. The SWACHE studies estimate the elasticity conditional on demographic covariates, whereas the welfare factor requires the unconditional gradient; the full paper reports both.

Table 1. Social value ratio and weighted value of avoiding chronic kidney disease (preliminary)

Country	OECD mean WTP	Gini	R, $\eta = 1$	R, $\eta = 1.3$	Weighted value, $\eta = 1.3$
Norway	2,933	0.259	0.957	0.945	2,771
Denmark	2,780	0.276	0.951	0.937	2,605
Canada	2,620	0.306	0.940	0.923	2,417
Germany	2,865	0.307	0.940	0.922	2,642
Italy	4,212	0.325	0.932	0.913	3,845
United Kingdom	2,148	0.367	0.913	0.888	1,908
United States	2,359	0.394	0.899	0.871	2,054
Türkiye	3,008	0.427	0.881	0.848	2,550
Chile	3,776	0.448	0.868	0.832	3,141

Note. Mean WTP per year in 2023 USD PPP (OECD Data Explorer, DF_SWACHE_PRIMARY). Gini of equivalised disposable income, OECD Income Distribution Database, 2023 (2022 for Chile, Denmark and Türkiye); variance of log income derived from the Gini under lognormality. $R = \exp(-\eta \cdot 0.2 \cdot \sigma^2)$.

The magnitudes are economically meaningful. The distributional correction lowers the values by 5.5 percent in Norway to 17 percent in Chile at $\eta = 1.3$, and it changes the ranking of countries: Türkiye moves from third to sixth. With the elasticity of one used in the VALESOR transfer, the correction in Chile would be 60 percent rather than 17; with the cross-country estimate it would become a premium. The full paper extends the

table to the ten endpoints and all OECD countries, compares the closed form with a direct computation by income decile where the survey data allow it, and adds an illustration across U.S. states, where differences in the dispersion of income move the weighted value by about 10 percent at a given mean.

Policy implications

The results show that equity-weighted benefit transfer does not require a redesign of benefit-cost practice. It is a transparent extension of it: agencies can report a weighted value next to the unweighted one, from published statistics, with the single value judgment, inequality aversion, stated explicitly. The magnitudes are large enough to matter for regulatory comparisons across countries and populations, and the choice of elasticity matters more than the choice of weights: an agency that borrows the elasticity used to transfer levels can obtain a correction of the wrong size or the wrong sign. Recent applications that report weighted benefits above unweighted ones (Burlile and Maniloff, 2024; Acland, 2026) also show why the normalization of the weights must be stated alongside the result.

Why EEPE

The OECD chemicals values will enter regulatory analyses in Europe and North America for years, at the same time as guidance asks for distributional analysis. The paper gives those analyses a method they can apply immediately, illustrated on the values they will actually use, and it speaks to the regulators, analysts and international organizations in the EEPE audience.

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