






# Renewing the Australian asthma agenda: lessons from the Finnish 10-year Asthma Program

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## Abstract

The Finnish Asthma Program, which ran between 1994 and 2004, has long been heralded as a benchmark of success in how to improve management and reduce asthma-related health service utilization. In Australia, there were 38,792 asthma hospitalizations in 2017–18, and 80% of these were considered avoidable (*J Asthma Allergy*. 2021;14:797–808. doi: 10.2147/JAA.S311721). To address this issue, Asthma Australia has set a strategic objective of halving avoidable asthma presentations to hospital by 2030. This article provides an overview of the Finnish Asthma Program, including an evaluation of critical success factors, outputs, and outcomes, followed by a synthesis of these findings for relevance and applicability to the contemporary Australian context that will inform policy and practice recommendations. Early diagnosis, effective anti-inflammatory medication, guided self-management, and monitoring disease control are still the keys to mitigating asthma burden. In the spirit of the Finnish Program, the digital transformation of healthcare and social media is enabling a new kind of systematic approach, both for patients and professionals.

## Keywords

Asthma, asthma management, policy, translation

## Introduction

The Finnish Asthma Program was undertaken between 1994 and 2004 after the Ministry of Social Affairs and Health in Finland recognized asthma as an important public health issue [1]. Although steered by the Ministry of Social Affairs and Health, the program was implemented by the Finnish Lung Health Association

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(Filha), a professional non-government organization. In October 1993, a working group was appointed to design a national program with the aim of preventing and alleviating problems caused by asthma and reducing associated costs [2]. It was designed to be a 10-year program with five specific goals as reported by Haahtela et al. [3] in 2001, being:

- (1) Recovery of as many patients as possible (not specifically defined in publications) with early asthma.
- (2) Asthma patients should feel well, and their ability to work and functional capacity should correspond with their age.
- (3) Decline in the percentage of patients with severe and moderate asthma from 40% to 20%.
- (4) Decrease in the number of asthma bed days by 50% by the year 2000 (to 50,000 a year).
- (5) Reduction in annual treatment costs per patient by 50% as a result of more effective prevention and treatment of symptoms.

## Materials and methods

These goals were to be achieved by placing an emphasis on primary health care, early diagnosis, and effective long-term treatment [1]. Measures implemented to achieve these goals as reported by Haahtela et al. [4] in 2006, included:

- (1) Early diagnosis and active treatment.
- (2) Guided self-management as the primary form of treatment.
- (3) Reduction in respiratory irritants such as smoking and environmental tobacco smoke exposure.
- (4) Implementation of patient education and rehabilitation (individually tailored and provided on an outpatient basis) combined with normal, individualized treatment that is timed appropriately.
- (5) Increase in knowledge about asthma among key groups.
- (6) Promotion of scientific research.

The premise underpinning the campaign was that asthma is an inflammatory disease requiring anti-inflammatory treatment from the outset [4]. A multipronged approach was taken to promote the program and provide the training necessary for implementation, including the provision of information to key groups, national discussion, and training, national asthma days as well as local and regional training in hospitals and health centers [2]. Within the first 5-years of the program, over 800 training sessions and seminars were organized with 25,000 persons trained [3]. There were nine national asthma forums (3,200 participants), 5,000 distributed asthma programs, 40,000 distributed asthma-related magazines, 150,000 distributed patient self-management guides, and 2,550 delivered slide and overhead sets [3]. Education and training programs were supported by written materials and information, including a guided self-management training pack, treatment guidelines, and telephone guidance.

In addition to education and training, there were several other activities planned and undertaken. This included revision of anti-smoking legislation, air quality regulations, and modified drug reimbursement regulations [3]. Changes to smoking legislation included a ban in workplaces, the introduction of smoke-free areas in bars and restaurants, and the illegalisation of tobacco sales to minors [3]. The program has been enlarged and improved upon several times. In 1997 almost all Finnish pharmacies were included in the Pharmacy Program, creating a network of 695 asthma pharmacists in local pharmacies [4]. There was a strategy to improve diagnostics and treatment supported by an early diagnosis and spirometry campaign in 1999 [3]. This campaign promoted the use of practical diagnostic tools such as spirometry and other lung function tests to diagnose and monitor asthma symptoms [3]. This is important, as an accurate diagnosis and early treatment can work to reduce asthma burden and prevent exacerbations [4]. By 2002 the program was enlarged again with the launch of the Childhood Asthma mini-Program (which included school-based education interventions, and child-specific asthma resources) as children with asthma had

almost exclusively been under the care of pediatricians, but the role of general practitioners (GPs) and primary care needed to be strengthened [4].

The asthma medication portion of the program was based on four essential principles [3], being:

- (1) Start effective treatment early (anti-inflammatory medication, inhaled steroid, check inhalation technique), make the patient understand the difference between a preventor [inhaled corticosteroids (ICS)] and reliever ( $\beta$ 2 agonist), gain the patient's confidence and improve the outcome.
- (2) Treat according to disease severity based on intermittent, mild, moderate, or severe symptoms.
- (3) Treat exacerbations early by proactively doubling the dose of an inhaled steroid for two weeks, adding a long-acting  $\beta$ 2 agonist, low-dose theophylline, or a leukotriene antagonist; if no response after two days add prednisolone and prevent further exacerbations by adjusting regular treatment.
- (4) Educate the patient with written self-management plan guided by peak expiratory flow measures.

Importantly, this program was successful in markedly reducing the burden of asthma, but it had no effect on the increasing disease prevalence observed [5].

Published results from the Finnish Asthma Program have been collated and summarised below. Please see [Supplementary material](#) for details of the search.

## Results

### Critical success factors

It was a new body of medical knowledge [3] that triggered national action, resulting in asthma being acknowledged for the first time as a community problem requiring broad commitments and reallocation of resources. The increasing need for action was taken up by medical experts and scientists and acknowledged by the government [3]. The new body of knowledge consisted of a better understanding of airway inflammation etiology; epidemiological evidence identifying an increase in the incidence and prevalence of asthma; increases in economic costs, and; evidence around the early use of ICS [3].

The Finnish Asthma Program was a coordinated, multi-faceted approach. The establishment of strong leadership, guidance, and advocacy with capacity building and networking among key contact people across organizations was considered as important to successful program implementation. In addition to government acknowledgment and support for a coordinated, well-resourced effort, it had the commitment of key stakeholders across hospitals, health services, and pharmacies. Three surveys were conducted among 1) chief physicians in hospital pulmonary units, 2) asthma contact persons (doctors, nurses) in health centers, and 3) contact persons in pharmacies [3]. A high commitment to the program was identified by chief physicians and two-thirds of 21 hospital districts had launched regional asthma programs in line with the national program by 1998 [3].

Beyond strategies for the prevention and treatment of asthma, the Finnish study included a detailed operational plan for the dissemination and implementation of the program [4]. Authors evaluating this program identified that effective strategies involved “multiple methods, decision support systems, and interactive education” [3]. The establishment of a steering group with multi-disciplinary representation was a key success factor, facilitating the creation of a “network of contacts” in local and regional health centers and treatment programs [3].

Costs associated with planning and implementing the program were considered small (direct additional costs of €650,000) [4], as most activities were carried out as part of routine clinical and administrative work [3]. The intervention was managed by integrating activities recommended within the Program into everyday practice and routine work of health professionals [4]. However, it is not clear if these practices were sustained over time. Government commitment toward the program was modest (€50,000 annually to support a pulmonologist to coordinate activities to a total of €125,000) but was important to show program commitment [3, 4].

## Outputs

Outputs consisted of:

- (1) Production and implementation of evidence-based guidelines.
- (2) Nation-wide upskilling of the health professional workforce across primary care.
- (3) Distribution of bespoke evidence-based resources for GPs, nursing staff, pharmacists, and respiratory specialists.
- (4) Distribution of bespoke evidence-based resources for people with asthma and their carers {free booklets, videos, and compact discs [compact disc read-only memories (CD-ROMs)] for patient education about asthma, allergy, smoking, indoor air quality, and ambient air pollution} [4].
- (5) Childhood asthma-specific resources including a practical checklist for GPs.
- (6) Development of a new “model of care” for asthma able to be scaled-up nation-wide with the addition of a mini-Program for childhood asthma and for pharmacists.

## Outcomes

It is worth noting that the length of hospital stay due to asthma and mortality rates were already reported to be decreasing in Finland since the early 1980's, i.e., prior to the implementation of the Finnish Asthma Program [3]. By 1999 the number of days in hospital was a quarter of that reported in 1981. More specifically, there were 38,000 fewer hospital inpatient days for asthma in 1999 (72,000, or 174 per 100,000 patients) than what was reported in 1993 (110,000, or 271 per 100,000 patients; i.e., the year prior to the Finnish Asthma Program launch) [3]. By 2003, this number had fallen again to 51,000 (120 per 100,000 patients or in absolute figures it had fallen by 69% since 1993) [4] and by 2013 it was 12,050 for people in secondary care [6]. There was a shift in outpatient visits to primary care, with a decrease in secondary care visits by 38% and an increase in primary care visits by 98% in total [6]. In summary, health services worked more efficiently in collaboration, rather than a siloed approach.

Mortality rates followed a similar declining trend to length of hospital stay [3]. Importantly, asthma-related deaths among children became very rare, with only a few cases having occurred in the 10-years prior to the year 2000 [3]. Between 1976 and 2003 there was a total of 27 deaths among people under 20-years of age due to asthma, with 10 deaths reported between 1990 and 2003 [4].

However, rates of admission among children with asthma were increasing prior to the program, from 7.3 per 1,000 in 1976 to 20.2 per 1,000 by 1995 [4]. Among those aged < 5-years, there was a 5.3-fold increase in hospitalizations, going from 2.6 per 1,000 in 1976 to 13.8 per 1,000 in 1995 [4]. By 2003, hospitalizations among children had decreased, but significant regional variation in admission practices following exacerbations resulted in a hospitalization range of 3.1 to 7.4 per 1,000 children [4].

Estimation of costs saved as a result of the Finnish Asthma Program have been speculated, with a potential saving of €128 million by 2003 [4] and between €120 million and €475 million by 2013 [6]. The 2003 estimate assumes the costs per patient in 2003 as being the same as those reported in 1993, while the 2013 values compare actual with predicted costs between the time period 1987 to 2013. Haahtela et al. [4] do acknowledge that health care and improved treatment would have saved some costs even without the program. Haahtela et al. [4] report ongoing concerns about the high incidence of asthma and growing drug costs.

Importantly, feedback and evaluation were recognized as key components of implementation, with the development of specific reports and publications as well as presentations at national and domestic conferences [3]. The evaluation strategy was developed post hoc, but it was recognized that rigorous evaluation plans are necessary for every large development program, which was not fully acknowledged in 1994 when the initiative commenced [4]. Unfortunately, it has meant that the true impact of the program cannot be fully understood [4].

Just as important as highlighting what should be done, is discussion around what was not done well. Poor patient compliance as well as lack of time and personnel (particularly to provide more education) were considered to be important factors impeding efficient asthma treatment delivery [1]. The need for a re-call system among GPs was identified as a priority with further development of their guided self-management plan [1].

It should be noted that with new digital systems, the main messages of the Finnish Asthma Program could be conveyed much faster than in 1994–2004. Investigators of the Finnish Asthma Program recently reported data from the Finnish Allergy Program 2008–2018, demonstrating that proactive digital messaging (including social media banner campaigns, and YouTube clips and interviews) resulted in a reduction in the public health burden of allergic disorders [7].

### Quality rating

The following is a quality review of the Finnish Asthma Program in accordance with the National Health and Medical Research Council (NHMRC) evidence matrix:

- (1) Evidence base (C rating): the evidence base for the Finnish Asthma Program was deemed to be Satisfactory, as per the NHMRC evidence matrix (see [Table 1](#)). However, as this was a population-wide Program, rather than an individual intervention study, the reliability of the results is very high. Moreover, results are provided on several large and comprehensive population-wide surveys comparing results over time (cohort studies) with good response rates from initial participant sample pools. Level III and IV evidence studies were included for review but given the country-wide application of the Finnish Asthma Program, this is appropriate to provide a satisfactory rating for evidence base. Please see [Supplementary material](#) for more details on each publication [1, 3, 4, 6, 8–12].
- (2) Consistency (A rating): all studies reported consistent findings over time and across different study authors, resulting in a level A rating of Excellent for consistency.
- (3) Clinical impact (A rating): the clinical impact was very large, resulting in a rating of Excellent, given studies were evaluating population-level data, large cohort data from across multiple health services, databases, or institutions, and/or included adequate representation of cohorts over time.
- (4) Generalisability (A rating): as this was a population-wide program, evaluated across various cohorts within Finland with comparisons over time or to a neighboring county (Russian Karelia), generalisability across the population in Finland was classified as Excellent.
- (5) Applicability (C rating): applicability of information to the contemporary Australian context was assessed as Satisfactory due to the time lapse between when the Finnish Asthma Program commenced and evaluated, as well as contextual factors and differences in health system design. Several aspects of the program are still applicable to the contemporary Australian context, particularly those surrounding the mechanisms and foundation upon which the Finnish Asthma Program was established.

### Relevance and transferability to the contemporary Australian context

The Finnish Asthma Program was launched into a relatively naive setting where no standardized treatment protocols existed [3]. Treatment with anti-inflammatory medication and bronchodilators was not commonplace [13]. Advancements in asthma care, in Australia and globally, have occurred since the program, through targeted pharmacotherapies, improved access to services, better diagnostics, and a strong focus on patient education and health professional skill development. Further, Australia is larger than Finland in both area and population, a discrepancy that can be extrapolated across to the relative size of the health ecosystem in each nation. The launch of the Finnish Asthma Program occurred at a time when disease prevalence was 3–5% of the population, affecting 150,000 to 250,000 Finns [2]. For comparison, an Australian study from 1997 identified that the prevalence of asthma was approximately 9% in children and 6% in adults [14]; given Australia has approximately four times the population of Finland, this seemingly

**Table 1.** National Health and Medical Research Council (NHMRC) matrix of evidence quality

Component	A Excellent	B Good	C Satisfactory	D Poor
Evidence base	Several level I or II studies with low risk of bias	One or two level II studies with low risk of bias or a systematic review or multiple level III studies with low risk of bias	Level III studies with low risk of bias, or level I or II studies with moderate risk of bias ***	Level IV studies, or level I to III studies with high risk of bias
Consistency	All studies consistent ***	Most studies consistent and inconsistency may be explained	Some inconsistency reflecting genuine uncertainty around clinical question	Evidence is inconsistent
Clinical impact	Very large ***	Substantial	Moderate	Slight or restricted
Generalisability	Population/s studied in body of evidence are the same as the target population in question ***	Population/s studied in the body of evidence are similar to the target population in question	Population/s studied in body of evidence differ to target population in question, but it is clinically sensible to apply this evidence to the target population	Population/s studied in body of evidence differ to target population and hard to judge whether it is sensible to generalise to target population
Applicability	Directly applicable to Australian context	Applicable to Australian context with few caveats	Probably applicable to Australian context with some caveats ***	Not applicable to Australian context

\*\*\*: NHMRC body of evidence matrix summarising the evidence base for the Finnish Asthma Program

Note. Adapted with permission from “Evidence for smoking quitlines” by Carson-Chahhoud K, Kopsaftis Z, Sharrad K, Esterman A. Sax Institute; c2019 [cited 2023 Nov 22]. Available from: [https://www.saxinstitute.org.au/wp-content/uploads/Evidence-Check\\_Evidence-for-smoking-quitlines.pdf](https://www.saxinstitute.org.au/wp-content/uploads/Evidence-Check_Evidence-for-smoking-quitlines.pdf)

small difference in percentage translates to a significant amount of people. The latest results from the Australian Bureau of Statistics reports current prevalence estimates of 11.2% (2.7 million people or one in nine Australians), a figure that has been increasing over the past 10-years [15]. Mortality from asthma in Finland was also exceptionally low, with 60–100 deaths per year in 1992–1993 (population 5.04 million) [2], compared to 351 Australian deaths in 2021 (0.2% of all deaths, population 24.6 million) [16]. Certain populations in Australia have higher rates of mortality, including people living in remote areas, low socio-economic status, and Aboriginal and Torres Strait Islander Australians [16]. Therefore, the transferability of the Finnish Asthma Program to the Australian context “as is” would not be appropriate.

Where there is strong relevance to the Australian context, is the mechanisms and foundations behind which their accomplishments originated. A coordinated approach with buy-in from all key stakeholders that was led, supported, and resourced by the Finnish government, was the primary driver of success. A common culture was built, where everyone had a role and contributed to the program [13].

## Conclusions

In conclusion, in the absence of a new drug or scientific breakthrough in the treatment and/or prevention of asthma as the catalyst for change, the following should be considered:

- (1) Effective program strategies involve multiple methods and decision support systems [4].
- (2) Establish a small steering group (not more than 7–10 people) [4] with representatives from the government, patient organizations, nursing, pharmacy, GP, and key experts.
  - Motivation of key stakeholders and organization of a program are two key aspects of success apart from the financial resources necessary to start-up and monitor a program [4].
- (3) Federal and state government resourcing is a lynchpin to demonstrate strong commitment.
- (4) Health service administrators need to allocate enough time for clinicians (inclusive of nursing, pharmacy, and allied health professionals) to provide effective asthma treatment during consultations and for professional development.

- (5) Small clinical improvements in standard practice can make a big difference (e.g., systematically instructing primary care staff how to use a two-week peak expiratory flow follow-up) [4]. Asthma needs to be identified as an important public health priority to incite action.
  - Take advantage of policy windows by being prepared with evidence and a coordinated plan with support from all key stakeholders.
  - Create a policy window by engaging with the media, advocacy groups, or government representatives who have a pre-existing vested interest in improving asthma outcomes.
- (6) Identify where gaps in current models of care exist to inform a strategy for a coordinated national response. Leverage off any new asthma-related legislation or policy directives to deliver a coordinated approach that increases the perceived scale and therefore impact of an intervention program among the public and health professionals proactive use of guided self-management is essential in preventing prolonged symptoms and exacerbations [4, 6].
- (7) Patient empowerment should be a focus, with the aim of helping people with asthma feel that they are managers of their treatment (as active partners), which is supported by health professionals rather than being dictated to them; which is recognized as being cost-effective compared to traditional treatment [6].
- (8) Strong anti-smoking messages and efforts toward tobacco prevention.
  - For patients with poorly controlled asthma, a home visit to assess exposure to tobacco smoke may be beneficial.
- (9) Ongoing education of both health professionals and patients was identified as a pressing need not fully realized in the Finnish Asthma Program [1].
- (10) Interactive education for health professionals (regional pulmonary and pediatric units) and people with asthma was an important component of success [4].
- (11) Prevention needs to be a focus, with consideration to the clinical phenomenon occurring before asthma (e.g., treatment of allergic rhinitis with immunotherapy prior to asthma diagnosis) [3].
- (12) Include an all-encompassing evaluation strategy for process outcomes and patient/health service outcomes, which includes a dissemination plan via reports, journal publications, and conference presentations.
- (13) Build a contact person network that establishes early engagement and buy-in across all participating hospitals and health centers who will in turn deliver any coordinated asthma program (i.e., a broad commitment by the healthcare system and society is mandatory and should be sought early in program development) [4] keeping this network of contact persons, GPs, nurses and pharmacists going is essential to the long-term success of the program.

## Abbreviations

GPs: general practitioners

## Supplementary materials

The supplementary material for this article is available at: [https://www.explorationpub.com/uploads/Article/file/100937\\_sup\\_1.pdf](https://www.explorationpub.com/uploads/Article/file/100937_sup_1.pdf).

## Declarations

### Author contributions

KCC: Conceptualization, Formal analysis, Investigation, Methodology, Supervision, Writing—original draft, Writing—review & editing. KS and RB: Investigation, Writing—review & editing. MB: Methodology,

Investigation, Writing—review & editing. TH: Conceptualization, Investigation, Formal analysis, Supervision, Writing—original draft, Writing—review & editing.

### Conflicts of interest

The authors declare that they have no conflicts of interest.

### Ethical approval

Not applicable.

### Consent to participate

Not applicable.

### Consent to publication

Not applicable.

### Availability of data and materials

Not applicable.

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