

2017 Model Practices

Applicant Information

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Model Practice Title

Please provide the name or title of your practice: *

Improving Air Quality through innovative approaches and partnerships

Practice Categories

Model and Promising Practices are stored in an online searchable database. Applications may align with more than one practice category. Please select all the practice areas that apply.: *

- | | | | | |
|---|--|---|---|---|
| <input type="checkbox"/> Access to Care | <input checked="" type="checkbox"/> Advocacy and Policy Making | <input type="checkbox"/> Animal Control | <input checked="" type="checkbox"/> Coalitions and Partnerships | <input type="checkbox"/> Communications/Public Relations |
| <input type="checkbox"/> Community Involvement | <input type="checkbox"/> Cultural Competence | <input type="checkbox"/> Emergency Preparedness | <input checked="" type="checkbox"/> Environmental Health | <input type="checkbox"/> Food Safety |
| <input type="checkbox"/> Global Climate Change | <input checked="" type="checkbox"/> Health Equity | <input type="checkbox"/> HIV/STI | <input type="checkbox"/> Immunization | <input type="checkbox"/> Infectious Disease |
| <input type="checkbox"/> Informatics | <input type="checkbox"/> Information Technology | <input type="checkbox"/> Injury and Violence Prevention | <input type="checkbox"/> Marketing and Promotion | <input type="checkbox"/> Maternal-Child and Adolescent Health |
| <input type="checkbox"/> Organizational Practices | <input type="checkbox"/> Other Infrastructure and Systems | <input type="checkbox"/> Organizational Practices | <input type="checkbox"/> Primary Care | <input type="checkbox"/> Quality Improvement |
| <input type="checkbox"/> Research and Evaluation | <input type="checkbox"/> Tobacco | <input type="checkbox"/> Vector Control | <input type="checkbox"/> Water Quality | <input type="checkbox"/> Workforce |
| <input type="checkbox"/> Conference Theme: Bridging Clinical Medicine and Population Health | | | | |

Other::

Is this practice evidence based, if so please explain. :

This practice draws upon and adapts evidence-based practices for improving air quality, as defined by the Environmental Protection Agency.

Winnable Battles

To keep pace with emerging public health challenges and to address the leading causes of death and disability, CDC initiated an effort called Winnable Battles to achieve measurable impact quickly. Winnable Battles are public health priorities with large-scale impact on health and known effective strategies to address them. Does this practice address any CDC's seven Winnable Battles? If so, please choose from the following: *

☐ Food Safety

☐ HIV in the U.S.

☐ Nutrition, Physical Activity, and Obesity

☐ Tobacco

☐ Healthcare-associated Infections

☐ Motor Vehicle Injuries

☐ Teen Pregnancy

☒ None

Overview: Provide a brief summary of the practice in this section (750 Word Maximum)

Your summary must address all the questions below:

- Brief description of LHD- location, demographics of population served in your community
- Describe public health issue
- Goals and objectives of the proposed practice
- How was the practice implemented/activities
- Results/Outcomes (list process milestones and intended/actual outcomes and impacts.
 - Were all of the objectives met?
 - What specific factors led to the success of this practice?
- Public Health impact of practice
- Website for your program, or LHD.

750 Word Maximum

Washington County is situated in the northwest corner of Oregon, stretching from the west side of the City of Portland to the Coast Range Mountains. The county offers a unique mix of urban, suburban and rural environments. It is home to large high-tech industry employers as well as large swaths of farmland. With a population of approximately 563,000 it is the second largest and most racially and ethnically diverse county in Oregon. The community has and continues to experience great change. The foreign-born population increased 11% between 2005 and 2014, while the Hispanic/Latino community increased 67.4% from 2000 to 2010. Although Washington County routinely ranks as one of the healthiest counties in our state, the averages those rankings rely on mask concerning disparities. Washington County ranks 29th for conditions that create healthy physical environment. In particular, we have some of the worst winter-time air quality in the state. The same rolling hills and mountains that frame our beautiful vistas also put us at risk of long periods of stagnant air in the winter. These cold air inversions trap the air, and everything we put in it, near the earth's surface for hours and sometimes days. These inversions occur during the coldest parts of winter, when folks are in most need of a warm home. In Washington County, nearly a third of households burn wood as a primary or secondary heat source. The devices that residents burn wood in can drastically impact our air quality. Older wood stoves are inefficient heat sources that produce a high amount of fine particle pollution. These ultra-fine particles travel deep into the lungs, ultimately passing into the bloodstream. Exposure to wood smoke and fine particle pollution is associated with a litany of health issues, including upper respiratory system inflammation and asthma, increased risk of cardiovascular disease and heart attacks, and increased risk of certain cancers. Exposure in pregnant women can lead to pre-term and low-weight births, conditions that impact the life course of a newborn. An Environmental Justice analysis found that pockets of the County with a high proportion of Latino and Hispanic communities are exposed to the highest levels of wood smoke pollution. Often times those who rely on old wood stoves to stay warm are most impacted by the harmful effects of wood smoke. The Washington County Public Health Division in partnership with the community set out to address this issue with the goal of: Reducing levels of wood smoke and PM_{2.5} in the winter while ensuring families stay warm. Our agency has pursued that goal through community-based collaborations, a focus on reducing disparities and implementing innovative and sustainable prevention strategies. The work has been organized around two objectives: 1. Reduce wood smoke through policy approaches that are responsive to community realities 2. Reduce or eliminate financial barriers for families who wish to transition to "cleaner" sources of home heat Over the past two years Public Health staff have advanced policies to limit unnecessary wood burning during periods of poor air quality. This included the development of a policy framework for issuing "no-burn days advisories" that has now been adopted through ordinance by the County Board of Commissioners and two City Councils. These policies now protect approximately 70% of Washington County residents and efforts are underway to ensure the policy framework is adopted by additional city governments within the county. Throughout the spring and summer of 2016, the Public Health Division partnered with the County's Office of Community Development to launch the Washington County Wood Stove Exchange. This initiative replaces old wood stoves with new and cleaner heat sources by providing a mix of grants and rebates to eligible households. The program quickly enrolled 200 households, four times the first year target of 50 replacements. The replacement of these old wood stoves achieves many outcomes. Families will benefit from more efficient heat sources, staying warmer and saving money. In fact, replacing just one old wood stove is equivalent to the particle pollution reduction of taking five old diesel buses off the road. The policy approach to reduced burning literally prevents tons of PM_{2.5} emissions, leading to improved air quality and community health. These are lasting impacts for the families served and the greater community. You can learn more about our efforts to improve community health by reducing wood smoke at www.WoodStoveExchange.com or www.co.washington.or.us/air

Responsiveness and Innovation

A Model Practice must be responsive to a particular local public health problem or concern. An innovative practice must be (1) **new to the field of public health (and not just new to your health department)** OR (2) **a creative use of an existing tool or practice**, including but not limited to use of an Advanced Practice Centers (APC) development tool, The Guide to Community Preventive Services, Healthy People 2020 (HP 2020), Mobilizing for Action through Planning and Partnerships (MAPP), Protocol for Assessing Community Excellence in Environmental Health (PACE EH). Examples of an inventive use of an existing tool or practice are: tailoring to meet the needs of a specific population, adapting from a different discipline, or improving the content.

- Statement of the problem/public health issue
- What target population is affected by problem (please include relevant demographics)
 - What is the target population size?
 - What percentage did you reach?
- What has been done in the past to address the problem?
- Why is the current/proposed practice better?
- Is current practice innovative? How so/explain?

- Is it new to the field of public health

OR

- Is it a creative use of existing tool or practice:

What tool or practice did you use in an original way to create your practice? (e.g., APC development tool, The Guide to Community Preventive Services, HP 2020, MAPP, PACE EH, a tool from NACCHO's Toolbox etc.)

- Is the current practice evidence-based? If yes, provide references (Examples of evidence-based guidelines include the Guide to Community Preventive Services, MMWR Recommendations and Reports, National Guideline Clearinghouses, and the USPSTF Recommendations.)

Please state the Responsiveness and Innovation of your practice (2000 Word Maximum) : *

Work by Washington County's Public Health Division to address this work is a model practice because of:

- The leadership role the local health department took in addressing an environmental determinant of health traditionally managed by the state environmental quality agency
- The adaptation of existing tools (such as PACE-EH) to rapidly address an emerging environmental hazard
- The explicit focus on addressing an environmental health disparity
- The unique and broad network of partners that were mobilized to improve air quality

Washington County initially learned of air quality concerns in the summer of 2014 when the Oregon Department of Environmental Quality (DEQ) shared data from an air quality monitor located in the City of Hillsboro (the County seat). Data showed levels of fine particle pollution (PM_{2.5}) had exceeded the federal health-based standard in two of the last three years. Three years of exceedances is a violation of the federal Clean Air Act. The federal standards are health-based, meaning that exceedances of the standard is an indication that large areas of the community are experiencing health impacts from poor air quality, particularly children, older adults and those suffering from an existing respiratory conditions. The small size of the particles produced by wood burning mean the smoke is especially dangerous. These fine-particles are breathed deep into the lungs and ultimately pass into the bloodstream, carrying with them an array of toxic compounds. Short-term impacts of exposure to wood smoke include irritation of the upper respiratory system and asthma symptoms. Long-term impacts include an increased risk of developing heart disease, lung disease and certain cancers. Additionally, Exposure in pregnant women can lead to pre-term and low-weight births, conditions that can impact the life course of a newborn. Aside from the public health consequences, violations of the federal clean air act can impact the economic vitality of a community for years and sometimes decades. When a community violates the federal clean air act they are designated as being in "nonattainment." The process of removing that designation involves decades of planning and implementing prescriptive air quality control techniques. These can include:

- Requiring expensive emission control technology to be installed on businesses and other facilities that emit fine particulate matter.
- Restricting new facilities from operating in the community or restricting existing business from increasing production.
- Implementing and enforcing strict burn ban programs throughout the community.

Permitted sources of air emissions (such as manufacturing facilities) are most impacted by nonattainment designations, despite being responsible for a small amount of fine particle pollution compared to residential wood burning. Understanding and communicating this dynamic to the business community was essential to developing a broad coalition of partners to reduce wood smoke. The Public Health Division also recognized that some communities within the County are impacted more than others. Washington County participated in a comprehensive air toxics study in the Portland-metro region that was conducted in 2012 by the DEQ. The study modeled concentrations of 19 pollutants around the region at the census tract-level. The study found that smoke from residential wood burning was the most significant source of air-toxics in the region, greater than industrial sources, cars, trucks, and construction equipment. At the request of local health authorities in the region an environmental justice analysis was performed as part of the study. That analysis found Hispanic and Latino communities are disproportionately exposed to residential wood smoke. Addressing this disparity with the community became a key objective in our wood smoke reduction work. In Oregon, air quality planning and improvement efforts are generally lead by the DEQ once a community has been designated as nonattainment. Limited resources and legal obligations result in the state agency prioritizing those areas that have already violated the clean air act. In keeping with public health principles, the Public Health Division felt compelled to take a leadership role in improving air quality and preventing a violation. The Division began by establishing a planning process that drew on elements from existing public health models, including PACE-EH. Specifically, PACE-EH tasks 11-13 were used to strategically address the issue of excess fine particle pollution:

- Task 11: Set priorities for action. With a clearly articulated goal (reduce levels of wood smoke pollution while keeping families warm in the winter), we engaged a variety of community partners to prioritize program and policy actions. These actions included: reduce the reliance on wood-burning as a heat source in Washington County, create a policy framework that eliminated unnecessary wood burning during periods of poor air quality and reduce the open burning of yard debris in the urban areas of the county. Criteria used to prioritize actions included effectiveness of the intervention, support of local policymakers, potential to address disparities, legal authority and community support. The support of policymakers was assessed through presentations to the Board of County Commissioners and the City Councils of key local jurisdictions in the area. Support from the community was assessed through an online and in-person survey (approximately 500 responses) administered during the summer months of 2015.
- Task 12: Develop an action plan. With a set of priority actions to pursue, Washington County Public Health continued to engage partners in the development of multiple action plans (one for each priority action). This process of developing action plans included an assessment of community assets, feasibility analyses, using evidence based practices (as defined in the EPA guidance documents for addressing residential wood smoke) and securing commitments from community partners. These actions included: (1) Launch a program that incentivizes the replacement of older wood stoves, (2) prohibit wood stove and fireplace use for non-heating purposes during episodes of poor air quality and (3) prohibit open burning as a method of disposing yard debris where alternative methods are available.
- Task 13: Evaluate progress and plan for the future. Two years into our work we are beginning to evaluate our progress. Key policies have been adopted and our wood stove exchange has launched. Details on our findings from evaluation activities can be found in the Evaluation section of the application. Our approach to identifying and implementing key strategies is unique in several respects:

- Public-Private Partnerships. At the time of this submission the County has secured \$500,000 from a local business to replace older and more polluting wood stoves. The Public Health Division approached the business with a proposal: the County would design and operate a wood stove replacement program if the local business was interested in funding the capital costs associated with the program (new heating appliances, installation costs, etc.). The business partner agreed after learning more about the impacts to their operations a Clean Air Act violation would have, despite their emissions being a negligible source of fine particulate matter.
- Equity. The Public Health Division applied an equity lens to the design and implementation of all action plans. Examples include:
 - o Woodstove and fireplace use restrictions: This policy was designed in a way that acknowledged many in the community burn wood to stay warm because it is either their sole source of heat, or because they cannot afford traditional utilities like electricity and natural gas. The policy exempts households who have no other heat source and/or who earn less than 80% of the region's median family income.
 - o Backyard burning of yard debris restrictions: This policy was designed so that restrictions only apply to households who have access to alternative methods of yard debris disposal. The adopted policy prohibits burning of yard debris year-round in areas of the County that receive curbside yard debris pickup. The County also created a free hardship permit for residents who may need to burn because of disability or financial hardship.
 - o

Wood Stove Exchange: Public health staff, in partnership with the County's Office of Community Development designed the program to ensure that those with the most need received the greatest benefit. Incentives offered are tiered based on household income. Residents (renters and home owners) who earn less than 80% of the region's median family income are eligible for a free replacement, up to \$5,500. Residents not eligible for a replacement can still receive a rebate between \$1,500-\$3,500, depending on income. Outreach of the program was also done using an equity lens. While the program is open to any county resident who relies on an old wood stove for heat, outreach efforts were targeted. The first target audience was neighborhoods in the County that have the greatest reliance on residential wood burning as a heat source (based on a statistically significant survey conducted by Portland State University). The second target was Hispanic/Latino residents, as this community was found to be disproportionately impacted by wood smoke in the environmental justice analysis. • Community Partnerships. The Public Health Division mobilized diverse community partnerships in this effort. Some examples include: o Contracting with Centro Cultural, a culturally specific organization to design and implement outreach strategies for the Hispanic/Latino community. o Partnering with Community Action, a community-based organization who provides energy assistance and low-income weatherization services to refer families into the Wood Stove Exchange. o Partnering with Oregon, Hearth, Patio and BBQ Association to engage local home-heating vendors/contractors in the design and implementation of the Wood Stove Exchange.

LHD and Community Collaboration

The LHD should have a role in the practice's development and/or implementation. Additionally, the practice should demonstrate broad-based involvement and participation of community partners (e.g., government, local residents, business, healthcare, and academia). If the practice is internal to the LHD, it should demonstrate cooperation and participation within the agency (i.e., other LHD staff) and other outside entities, if relevant. An effective implementation strategy includes outlined, actionable steps that are taken to complete the goals and objectives and put the practice into action within the community.

- Goal(s) and objectives of practice
- What did you do to achieve the goals and objectives?
 - Steps taken to implement the program
- Any criteria for who was selected to receive the practice (if applicable)?
- What was the timeframe for the practice
- Were other stakeholders involved? What was their role in the planning and implementation process?
 - What does the LHD do to foster collaboration with community stakeholders? Describe the relationship(s) and how it furthers the practice goal(s)
- Any start up or in-kind costs and funding services associated with this practice? Please provide actual data, if possible. Otherwise, provide an estimate of start-up costs/ budget breakdown.

5000 words maximum

Enter the LHD and Community Collaboration related to your practice (5000 words maximum): *

As mentioned previously, the Washington County Public Health Division in partnership with the community set out to address this issue through one key goal: Reduce levels of wood smoke and PM2.5 in the winter while ensuring families stay warm. Our agency has pursued that goal through community-based collaborations, a focus on reducing disparities and implementing innovative and sustainable prevention strategies. The work has been organized around two objectives: 1. Reduce wood smoke through policy approaches that are responsive to community realities 2. Reduce or eliminate financial barriers for families who wish to transition to "cleaner" sources of home heat The Public Health Division used two separate community and partner engagement processes to inform the two objectives. Community engagement related to policy development. The Public Health Division convened a Wood Smoke Advisory Team in the spring of 2015 to inform the development of policy approaches to reduce wood smoke. Advisory team members were identified through existing partnerships, gaps in partnerships related to air quality and wood burning, and additional partners that approached the County about being involved in the issue. Organizations that were represented on the advisory team included: - Oregon DEQ: The state agency responsible for environmental quality - City of Hillsboro: The most populous city in the county - City of Cornelius: A small town adjacent to Hillsboro with high rates of poverty and a high number of residents who rely on wood burning - City of Beaverton: The second most populous city in the county - Community Action of Washington County: A community-based organization who provides energy assistance and weatherization services to low-income households - Oregon Department of Energy: The state agency responsible for energy planning and energy-related tax credits - Neighbors for Clean Air: A community-based air quality advocacy organization - Oregon Environmental Council : The state's largest environmental health advocacy organization - Portland General Electric: The primary electric utility serving the county - NW Natural Gas: The primary natural gas utility serving the county - Washington County Community Participation Program: The county program responsible for managing community engagement and outreach - Washington County Solid Waste and Recycling: The county agency responsible for regulating solid waste and yard debris disposal - Oregon Hearth, Patio and BBQ Association: A statewide association of wood stove retailers and installers - Fireside Home Solutions: A local fireplace and wood stove retailer The advisory team provided guidance to the County on policy development and community engagement efforts related to wood smoke reduction. At the advisory team's request the County partnered with the City of Hillsboro to conduct resident surveying on the perceptions of wood smoke pollution and to gauge support for restrictions. Key findings from that effort include (~500 responses): • A majority of residents do not perceive wood smoke as a health issue • A majority of resident do not regularly burn wood to stay warm • A slight majority (55%) of residents supported efforts to reduce unnecessary wood burning during periods of poor air quality • A slight majority (60%) of residents supported efforts to reduce open burning of yard debris in residential areas The advisory team convened three more times after the community surveying was complete to study policies in place around the Pacific Northwest, design a model policy for use in Washington County, draft key messages and inform the County's community engagement efforts. Concurrent with the

advisory team process, the Public Health Division was priming local policymakers for action related to wood smoke reduction by conducting briefings before the County's Public Health Advisory Council, County Board of Commissioners, City Councils, and city managers. These briefings were an opportunity to highlight the public health risks of wood smoke pollution, the economic consequences of a Clean Air Act violation and to test the support of potential policy solutions. When the time came for policymakers to consider adoption of the wood smoke reduction ordinances, members of the advisory team unanimously expressed their support. Upon policy adoption the Public Health Division engaged new partnership to assist in implementing a communication strategy informing the community of the new restrictions, exemptions and relevant resources. Some of these partnerships include:

- The Oregon Department of Forestry (ODF). ODF operates a field office in Washington County that grants wood-cutting permits for state lands. Residents must obtain a permit, in-person, before harvesting firewood from public lands in the region. ODF staff distributed a fact-sheet about the new burning restrictions and information about exemptions with every wood-cutting permit they issued in the fall of 2015. The following year, ODF distributed the information again along with a postcard on the newly launched Wood Stove Exchange.
- The Boys Scouts of America, Cascade Pacific Council. The Public Health Division partnered with Boy Scouts Troops throughout Washington County to distribute door-hangers to over 15,000 households in the Fall of 2014, 2015 and 2016. Each door hanger included information on new burning restrictions and the connection between air quality and health. This partnership also allowed the Public Health Division to discuss environmental public health with youth throughout the county. Community and partner engagement related to program development. The Public Health Division had prioritized the development of a wood stove replacement program as a long-term strategy for reducing wood smoke. However the Division was also aware that operating such a program was outside of its current capacity and expertise. In the fall and winter of 2015 the Division assembled an inventory of governmental and community partners to approach about operating a replacement program. One partner included the County's office of Community Development (OCD). OCD was already administering similar programs that offered grants and rebates to low-income households for health and safety improvements. Improvements like roof repairs, wheelchair accessibility retrofits and plumbing repairs. Although OCD was initially reluctant, they agreed to host the proposed program if the Public Health Division could secure adequate funding for staff, program oversight and program marketing. The Public Health Division and OCD collaboratively drafted a Memorandum of Understanding (MOU) formalizing the roles, responsibilities and expectations of each department. Moving forward Public Health and OCD staff created a joint work plan organized into seven domains:

- Formalizing inter-agency coordination
- Stakeholder and partner engagement
- Program design
- Program staffing (creating and recruiting for new positions)
- Vendor selection
- Program marketing and outreach
- Participant enrollment

The Public Health Division and OCD engaged a variety of partners in the program design phase of the work.

- Oregon Hearth, Patio and BBQ Association: Public Health staff had developed a relationship with OHPBA over the previous year when designing policy approaches for reducing wood smoke. This included regularly checking in with the association director and attending association meetings to provide periodic updates to local fireplace/wood stove vendors. In the context of designing the exchange program, OHPBA staff and their membership participated in a focus group on what the County should consider when designing and implementing the exchange program. The OHPBA also provided technical assistance related to the pricing and performance of replacement heating appliances.
- National Hearth, Patio and BBQ Association: The National HPBA has been involved with dozens of wood stove replacement programs throughout the country. Program staff consulted with the association on numerous occasions and was also connected, through the association, to other local governments that had experience reducing wood smoke.
- Portland General Electric (PGE): PGE provides electricity to the bulk of Washington County residents and offers a variety of incentives to households who install electric heat pumps as a heat source. Program staff consulted with PGE to ensure that families participating in the wood stove exchange could layer the program benefits with existing incentives being offered by PGE. This partner work involved developing a crosswalk of replacement types to identify which would be eligible for both rebates/incentives.
- NW Natural Gas: NW Natural is sole provider of natural gas service to Washington County residents and offers a variety of incentives to households who install gas stoves and fireplaces Program staff consulted with NW Natural to ensure that families participating in the wood stove exchange could layer the program benefits with existing incentives. This partner work involved developing a crosswalk of replacement types to identify which would be eligible for both rebates/incentives.
- Energy Trust of Oregon: Energy Trust of Oregon administers the rebates offered by PGE and NW Natural. They provided technical assistance to program staff on the design of rebates, eligibility requirements, vendor/contractor relations and marketing techniques.
- Enhabit: Enhabit is a community-based organization that matches residents who are interested in improving the energy assistance of their homes with qualified contractors. Enhabit has over a decade of experience running home efficiency upgrade programs. Enhabit assisted program staff in communicating with contractors and vendors when the exchange program was seeking applications from interested parties to perform replacement work.
- Environmental Protection Agency (EPA): The EPA enforces federal ambient air standards and prepares guidance documents for local governments who wish to reduce levels of wood smoke. Program staff has met periodically with EPA to report on efforts in Washington County and to connect, through EPA, with other local governments who have successfully reduced levels of wood smoke.
- Community Action of Washington County: Community Action serves a demographic very similar to the target community for the wood stove exchange. Program staff regularly consulted with Community Action during the development of the program on a variety of issues including, managing application, cross-referring families between agencies, vendor relations and outreach strategies. Prior to the wood stove exchange program launching, Community Action identified 50 eligible families and assisted them in applying for the program. Public Health Division staff also convened a marketing committee made up of internal and community partners. The committee was charged specifically with developing a comprehensive marketing and outreach plan for the wood stove exchange program. This committee included:

- Washington County communications staff
- City of Hillsboro communications staff
- City of Cornelius City Manager
- Community Action Information and Referral staff
- Centro Cultural de Washington County (a culturally specific community based organization)
- Fireside Home Solutions

The marketing committee met four times and produced foundational products for the wood stove exchange program, including:

- A comprehensive outreach plan
- A portfolio of print marketing materials
- A social media toolkit for the program
- An informational video: <https://www.youtube.com/watch?v=yQ5xV4S2GRw&feature=youtu.be>
- A program website: www.WoodStoveExchange.com

In conjunction with the marketing committee work, the Public Health Division contracted with Centro Cultural to design and implement a culturally and linguistically appropriate outreach plan for the Hispanic/Latino community. Their work to date includes:

- Launching a Spanish-language webpage on the program
- Marketing the program through community-specific social media outlets
- Training community leaders on the program, application procedures, eligibility etc.
- Designing Spanish-language program materials, including an application
- Providing one-on-one assistance

to members of the Spanish-speaking community who are interested in applying for the exchange program Business Community Engagement As mentioned previously, the business community has been a key constituent in this work. The Public Health Division has worked since the summer of 2014 to educate the business community on the economic development consequences of a Clean Air Act violation. Through this effort the Public Health Division developed a partnership with the Westside Economic Alliance (WEA). WEA serves as a chamber of commerce for the western suburbs of the Portland-metro region. Developing the partnership with WEA has given the Public Health Division access to business leaders with both a community and financial interest in clean air. Tangible outcomes from the partnership include:

- WEA has facilitated connections between the Public Health Division and major employers in the area who have helped raise awareness of the new burning restriction requirements and the wood stove exchange.
- WEA devoted their monthly column in the Business Tribune in October 2016 to the wood stove exchange. Read the article at: <http://portlandtribune.com/but/261-columns/326683-206136-clearing-the-air-through-a-wood-stove-replacement-program%20>
- Facilitating connections with hospital systems that perform in-home care to market the exchange program to their patients, when appropriate.
- WEA articulating the business case for reducing wood smoke pollution to their constituents at board meetings, through their member newsletters and before elected officials.

Partnerships in funding. The launch of the Wood Stove Exchange program is the result of public-private funding collaborative. Expenses associated with the program include:

- Annual personnel and operating costs of approximately \$180,000
- Annual marketing and outreach costs of \$30,000
- The capital costs of replacing old wood stoves. For lower-income households the program funds the entire replacement at an average cost of \$4,000 per replacement. For other participants the capital costs are in the form of a rebate of \$1,500-\$3,500 given to the participant. With a goal of replacing 700 stoves in five years, the total costs of the initiative are estimated to be approximately \$4 Million. The current revenue is comprised of contributions from public and private entities:
- \$700,000 in Washington County general fund dollars (The Board of Commissioners has committed to an annual appropriation of \$350,000 for five years)
- \$75,000 in City of Hillsboro general fund dollars
- \$500,000 from a local business partner Washington County Public Health and the Office of Community Development have acted as conveners throughout the policy and program development process, but the success of the initiatives has been made possible through the many contributions of diverse partners.

Evaluation

Evaluation assesses the value of the practice and the potential worth it has to other LHDs and the populations they serve. It is also an effective means to assess the credibility of the practice. Evaluation helps public health practice maintain standards and improve practice. Two types of evaluation are **process** and **outcome**. Process evaluation assesses the effectiveness of the steps taken to achieve the desired practice outcomes. Outcome evaluation summarizes the results of the practice efforts. Results may be long-term, such as an improvement in health status, or short-term, such as an improvement in knowledge/awareness, a policy change, an increase in numbers reached, etc. Results may be quantitative (empirical data such as percentages or numerical counts) and/or qualitative (e.g., focus group results, in-depth interviews, or anecdotal evidence).

- What did you find out? To what extent were your objectives achieved? Please re-state your objectives.
- Did you evaluate your practice?
 - List any primary data sources, who collected the data, and how (if applicable)
 - List any secondary data sources used (if applicable)
 - List performance measures used. Include process and outcome measures as appropriate.
 - Describe how results were analyzed
 - Were any modifications made to the practice as a result of the data findings?

2000 Words Maximum

The Washington County Public Health Division in partnership with the community set out to address this issue with the primary goal of: Reducing levels of wood smoke and PM_{2.5} in the winter while ensuring families stay warm. Our agency has pursued that goal through community-based collaborations, a focus on reducing disparities and implementing innovative and sustainable prevention strategies. The work has been organized around two objectives: 1. Reduce wood smoke through policy approaches that are responsive to community realities 2. Reduce or eliminate financial barriers for families who wish to transition to “cleaner” sources of home heat

Evaluation of this work is organized into three domains:

- Policy adoption measures
- Wood stove exchange process and outcome measures
- Air quality improvement

Policy adoption outcomes measures

The intent of these measures is to assess the success of the Public health Division policy advocacy work throughout the county in terms of policies adopted and number of residents protected by stronger air quality regulations. To date, successes include:

- The adoption of stronger air quality regulations (wood stove use restrictions and yard debris burning restrictions) by three policymaking bodies; the Washington County Board of Commissioners, the Hillsboro City Council and the Cornelius City Council.
- The adoption of these policies has positively impacted the air quality for approximately 390,000 residents, or 70% of Washington County’s population.

Wood stove exchange process and outcome measures

The Public Health Division and the Office of Community Development has implemented a comprehensive program dashboard that captures data on program marketing, applicant count, participant characteristics (demographics, preferred appliance type etc.), dollars leveraged and completed replacements. The following tables include key data from the most recent dashboard report:

Incentive type	Application count
Grant (full cost replacement)	96
\$1,500 rebate	59
\$2,500 rebate	9
\$3,500 rebate	21
Ineligible	23

Preferred replacement type

Application count	Certified clean-burning wood stove	92
Pellet stove	29	
Gas stove	45	
Electric heat pump	12	
Gas or propane furnace	7	

Location of residence

Application count	Hillsboro	92
Unincorporated Washington County	28	
Banks	3	
Beaverton	39	
Cornelius	15	
Forest Grove	4	
Gaston	7	
North Plains	7	
Sherwood	1	
Tigard	10	
Tualatin	2	

Air quality improvement

In the short-term, Washington County Public health staff are modeling reductions in particle pollution from the wood stove exchange using an EPA air quality modeling tool. Based on data from the first 150 eligible applicants in the wood stove exchange, those investments will result in an annual reduction (prevention) of 12 tons of fine particulate matter. That reduction translates to an immediate health benefit that can be monetized through a cost-benefit analysis. The EPA estimates that preventing one ton of fine particulate matter (PM_{2.5}) results in health savings of \$360,000 . Health savings included avoided healthcare expenses, but also the value of avoided morbidity/mortality using the value of statistical life (VSL). Replacing 150 old wood stoves results in a total health savings of \$5,400,000. The administrative and capital costs associated with replacing those stoves is approximately \$800,000. The program has also purchased an indoor particle counter and is exploring a partnership with program vendors to evaluate indoor air quality improvements as a result of stove replacements. The ultimate evaluation will be changes in ambient concentrations of particle pollution in Washington County. The Public Health Division will continue to monitor air quality data collected by ambient air monitors in the community and measuring progress on two indicators:

- Average annual concentrations of PM_{2.5}
- The number of days where ambient levels of PM_{2.5} exceed the federal health-based standard

Sustainability

Sustainability is determined by the availability of adequate resources. In addition, the practice should be designed so that the stakeholders are invested in its maintenance and to ensure it is sustained after initial development (*NACCHO acknowledges that fiscal challenges may limit the feasibility of a practice's continuation.*)

- Lessons learned in relation to practice
- Lessons learned in relation to partner collaboration (if applicable)
- Did you do a cost/benefit analysis? If so, describe.
- Is there sufficient stakeholder commitment to sustain the practice?
 - Describe sustainability plans

1500 Words Maximum

Please enter the sustainability of your practice (2000 Words Maximum): *

The policy change initiatives associated with this work are sustainable in that the policies have been formally adopted by local policymaking bodies and codified in county and city municipal codes. Enforcement of these policies has been integrated into the existing code enforcement systems of the relevant agencies. The County is continuing work to secure adequate funding for the wood stove exchange to replace 700 old wood stoves. This work involves identifying additional public and private entities that benefit from improved air quality. Lessons learned from developing and implementing policy approaches to reducing wood smoke include:

- Burning wood for heat carries cultural significance in many communities of the Pacific Northwest. This must be taken into consideration when framing messages for the community and policymakers. Local health officials should acknowledge that significance and the reality that some people burn wood for heat, not out of necessity, but preference.
- Policy adoption should not be considered the end of the work. Communicating new policies, their public health rationale and community health benefit is a continual process. Especially when the policy requires behavior change in your community.
- Fostering diverse partnerships is key to success. Support from the business community, wood stove retailers and economic development agencies was more influential to many policymakers than support from public health and air quality advocates. Lessons learned from the development of a wood stove exchange include:

- Similar to policy development, diverse partnerships are essential. The expertise, networks and resources that partners bring will expand the program's reach and ensure success.
- Be flexible in your messaging. Old wood stoves never go bad, so there is little incentive for residents to replace them. Your program should clearly articulate the many benefits of replacing an appliance. As a public health official, the inclination is to use health messages. It is important to highlight the non-health benefits as well, such as:
 - o Improved efficiency. Burn no, or less wood and get better heat
 - o Save the time and energy of splitting, stacking and moving wood
 - o Improve the value of your property with a new heating appliance
- Engage the business who will "do the work" early. Develop relationships with local wood stove retailers and installers, build trust and generate excitement about the exchange program. These businesses are key partners in marketing the program and ensuring the public health benefits are achieved.

Additional Information

How did you hear about the Model Practices Program?: *

- | | | | | |
|---|---|---|--|--|
| <input checked="" type="checkbox"/> I am a previous Model Practices applicant | <input type="checkbox"/> At a Conference | <input type="checkbox"/> NACCHO Website | <input type="checkbox"/> Public Health Dispatch | <input type="checkbox"/> Colleague in my LHD |
| <input type="checkbox"/> Model Practices brochure | <input type="checkbox"/> NACCHO Exhibit Booth | <input type="checkbox"/> NACCHO Connect | <input type="checkbox"/> Colleague from another public health agency | <input type="checkbox"/> E-Mail from NACCHO |
| <input type="checkbox"/> NACCHO Exchange | | | | |