

DRAFT ASHP Statement on the Pharmacist's Role in Public Health

1 Position

2 Pharmacists play a vital role in maintaining and promoting public health. All pharmacists
3 have a responsibility to participate in global, national, state, regional, and institutional
4 efforts to promote public health and to integrate the goals of those initiatives into their
5 practices. Furthermore, pharmacists have a responsibility to work with public health
6 planners to ensure their involvement in public health policy decision-making and in the
7 planning, development, and implementation of public health efforts.

8 The primary objectives of this statement are to (1) increase awareness of pharmacists'
9 contributions to public health, (2) educate pharmacists about public health and their role in
10 promoting public health, (3) describe the role of pharmacists in public health planning and
11 promotion, and (4) identify new opportunities for pharmacists' involvement in future public
12 health initiatives. This statement does not provide an exhaustive review of pharmacists'
13 public health activities. Its intent is to stimulate dialogue about the role that pharmacists
14 can play in improving public health in the U.S.

15

16 Background

17 Public health is a science-based field designed to "protect and improve the health of people
18 and their communities."¹ In contrast to clinical medicine, public health concentrates on
19 whole populations and communities, working to improve the places where they "live, learn,
20 work and play,"² through health promoting policies, prevention, interventions and
21 education.

22 These goals are accomplished through an upstream approach, or what could be
23 considered “upstream healthcare.” Public health recognizes four levels of prevention:
24 primordial, primary, secondary and tertiary.³ Primordial prevention is prevention of risk
25 factors for disease, illness, injury, or poor health outcomes from ever developing; primary
26 prevention is the prevention of disease, illness, injury, or poor health outcomes from
27 occurring; secondary prevention focuses on reducing the impact of disease, illness, injury,
28 or poor health outcomes; and tertiary prevention focuses on minimizing the impact of
29 disease, illness, injury, and poor health outcomes.³ While all four levels of prevention are
30 recognized and used in public health, primordial and primary prevention are considered
31 largely upstream, whereas secondary and tertiary prevention are considered more
32 downstream. Public health focuses heavily on upstream efforts while also working closely
33 with the medical community and others to positively impact downstream work. Examples of
34 the different types of prevention can be found in Table 1.

35 There are many factors that contribute to the overall health of a community or
36 population. To understand how best to prevent the risk factors of disease, illness, injury,
37 and poor health outcomes from ever developing, one must first understand the many
38 factors that contribute to overall health, referred to as “determinants of health.” While
39 there are many determinants of health, most can be grouped into five primary categories:
40 social factors, referred to as “social determinants of health”; policy; health services;
41 individual behavioral choices; and biology and genetics⁴:

- 42 • **Social determinants of health** include but are not limited to socioeconomic
43 status, employment status, educational attainment, cultural and physical

44 environment, family influence, intimate partners, social groups, and religious
45 groups.

46 • **Policy** includes but is not limited to economic policies, political policies,
47 justice policies, educational policies, health policies, work policies, and
48 neighborhood and zoning policies.

49 • **Health services** include but are not limited to access to services, quality of
50 services, cost of services, insurance coverage, language access, health
51 programs, and time and means of access.

52 • **Individual behavioral choices** include but are not limited to diet; physical
53 activity; alcohol, drug, or tobacco use; handwashing; sexual activity; stress
54 management; sleep; and therapy adherence issues.

55 • **Biology and genetics** include but are not limited to age; gender; sex;
56 biological response to stimuli, stress, or medications; and genetic
57 predispositions.

58 The combination of these factors heavily influences the overall health of individuals,
59 communities, and populations, making healthy living either easier or more difficult.² These
60 factors are closely intertwined, with no single determinant independent of the others. One
61 study ranked the relative contributions of determinants of health to overall health as
62 follows: behavior, 40%; genetics, 30%; social factors 15%; healthcare, 10%; and
63 environmental factors, 5%.⁵ As Shermock points out, “[e]ven if we get the part that
64 healthcare practitioners typically focus on *completely right*, that still leaves 90% of what
65 determines health unaccounted for.”⁶

66 Public health seeks to understand the determinants of health and their influence on
67 risk factors, disease, illness, injury, and negative health outcomes through research. That
68 knowledge is then used to improve the determinants of health and remove the barriers to
69 healthy living, making the healthy choice the easier one.

70

71 **Public Health Activities of Pharmacists**

72 In 2006, the American Public Health Association (APHA) outlined the public health role of
73 the pharmacist in a statement⁷ building on two previous APHA publications.^{8,9} In 2013, the
74 American Association of Colleges of Pharmacy recognized the important role pharmacists
75 can play in public health by including population-based care and reducing health
76 disparities and inequalities in its Center for Advancement in Pharmaceutical Education
77 (CAPE) Educational Outcomes.¹⁰ These outcomes also emphasized the pharmacist’s role in
78 the public health components of “design[ing] prevention, intervention, and educational
79 strategies for individuals and communities to manage chronic disease and improve health
80 and wellness.”¹⁰

81 The public health duties that an individual pharmacist performs will vary, based on the
82 individual’s experience, abilities, training, and work setting. All pharmacists, working alone
83 or in collaboration with healthcare colleagues and administrators, can contribute to the
84 promotion of public health. ASHP has described roles pharmacists have in specific public-
85 health-related activities, including antimicrobial stewardship and infection control¹¹;
86 substance abuse prevention, education, and treatment¹²; prevention of controlled
87 substances diversion¹³; managing drug product shortages¹⁴; immunization¹⁵; tobacco

88 cessation¹⁶; and emergency preparedness and response.¹⁷

89 The following are examples of other activities that pharmacists can engage in to
90 promote public health:

- 91 ● Promoting population health.
- 92 ● Developing disease prevention and control programs (including chronic disease or
93 disease treatment programs).
- 94 ● Promoting medication safety efforts in their institutions and communities.
- 95 ● Engaging in opioid stewardship efforts, including prevention, intervention, and
96 treatment.
- 97 ● Developing health-education policies and programs within their institutions that
98 address the needs of patients, other healthcare professionals, community leaders,
99 and the public, individually and as members of committees with purview over public
100 health-related activities; and participating as members of public health organizations
101 and chapters in pharmacy organizations.
- 102 ● Advocating for sound legislation, regulations, and public policy regarding disease
103 prevention and management.
- 104 ● Engaging in public health-related research and education programs, initiating
105 campaigns to disseminate new knowledge, and providing training programs that
106 include basic population health tools such as statistical analysis, epidemiology,
107 disease surveillance techniques, risk reduction strategies, insights into
108 methodology.¹⁸

109 **Population health.** Although pharmacists have a role in both, it is important to

110 distinguish population health from community health. Community health “encompasses
111 population groups and the locus (e.g., place, venue, or other unit) of programs,
112 interventions, and other actions,”¹⁹ typically implying a geographic basis. In contrast,
113 population health focuses on groups of individuals defined by specific characteristics other
114 than geography, such as a health determinant or disease state. For example, Kindig and
115 Stoddart defined population health as “the health outcomes of a group of individuals,
116 including the distribution of such outcomes within the group.”²⁰ They proposed that the
117 field of population health includes policies and interventions that link health outcomes and
118 patterns of health determinants. Evans, Barer, and Marmor²¹ described factors in the social
119 environment, external to the healthcare system, that exert a major and potentially
120 modifiable influence on the health of populations.

121 Efforts to improve population health have been defined in different ways. The
122 Institute for Healthcare Improvement Triple Aim Initiative uses the term “population health
123 management” to describe “the work by healthcare organizations to improve outcomes for
124 individual patients to maximize population health,” whereas the National Academy of
125 Medicine prefers the term “population health improvement” to describe “work to identify
126 and improve aspects of or contributors to population health, expanding the focus beyond
127 traditional healthcare delivery systems.”²² Homsted et al.²³ provide a process-based
128 definition of population health management:

129 The active process of strategically utilizing health determinant data for a defined
130 cohort to design, coordinate, and deliver high-quality, cost-effective, patient-
131 centered care across the continuum, through optimizing communication,

132 collaboration, and utilization of available resources with the goal of creating and
133 sustaining health.

134 Population health management, a subset of population health, focuses on the
135 comprehensive care of a specific population to implement needed services and
136 interventions to improve the population's health.²⁴ Pharmacists can participate in
137 population health management by being able to identify the needs of a population and
138 implement necessary changes by, for example, performing medication reviews (especially
139 of risky or costly medications) and working with other healthcare providers to develop care
140 paths and chronic disease state management programs.²⁶ Given the importance of behavior
141 as a determinant of health, pharmacists can improve population health through concerted
142 actions to improve adherence to medication, diet, and exercise regimens, and through
143 efforts to discourage harmful behaviors such as tobacco use, substance abuse, and high-risk
144 sexual activity. Pharmacists practicing in ambulatory care and primary care settings are
145 particularly well positioned to help ensure patients have received appropriate preventive
146 care, such as well care visits, immunizations, and screenings (e.g., mammograms,
147 colonoscopies). Those pharmacists also have a role in population health management by
148 contributing to team-based monitoring and education of patients about healthy lifestyle
149 choices and screening for social determinants of health.²⁶

150 Medication therapy management (MTM) programs provide one example of a role
151 pharmacists can have in population health management. MTM broadly
152 encompasses a range of healthcare services provided by pharmacists that optimize patient
153 outcomes. Pharmacists can expand their roles by leveraging provider status to improve

154 public health through MTM.²⁷ MTM can be used to identify and resolve drug therapy
155 problems. Pharmacists can develop comprehensive individual care plans, identify and
156 meet vaccination needs, and improve health outcomes through adherence and
157 management of chronic diseases. MTM has the potential to go beyond the treatment and
158 management of diseases and provide pharmacists an opportunity to identify social
159 determinants of health during patient care conversations (e.g., identifying social
160 determinants of health such as food insecurities may shed light on why a patient skips
161 meals and insulin, leading to uncontrolled diabetes) and help address them. Identifying
162 social determinants of health that are impacting patient outcomes and advocating for
163 these patients is an important aspect of MTM, and the future of pharmacy must
164 incorporate social determinants of health principles if the profession is to treat the whole
165 patient and meet the needs of an integrated and multi-professional healthcare system.

166 Some of the leading health initiatives of Healthy People 2030 include smoking
167 cessation, fall risk assessment, vaccinations, and medical product safety,²⁸ which can all be
168 addressed during MTM services provided by pharmacists. Motivational interviewing should
169 be utilized for those who are actively smoking, and benefits of quitting discussed during
170 MTM sessions. This activity, along with identifying needed vaccines and potential fall risks,
171 could improve public health and patient outcomes.

172 The outcomes from the 2013 Center for the Advancement of Pharmacy Education
173 (CAPE) emphasize the importance of this ability for future pharmacists to be trained in
174 identifying and critically analyzing information that may impact patient-centered and
175 population-based care.¹⁰ As the volume of population and patient data grows, along with

176 the ability to analyze that data using tools such as machine learning, human language
177 processing, and harvesting of data from health apps and social media, well-trained
178 pharmacists will be able to harness the power of big data to care for populations more
179 efficiently and effectively.

180 ***Disease prevention and control.*** Pharmacists can be involved in disease prevention
181 and control in many ways. For example, they can help develop institutional screening
182 programs to check immunization status and identify undiagnosed medical conditions (e.g.,
183 hypertension, diabetes, hyperlipidemia, depression, substance abuse, behavioral health
184 issues). Pharmacists have gained authority in many parts of the U. S. to administer
185 immunizations, sometimes with a prescription from a physician, but often just at the
186 request of the patient, and are making it a routine part of offered services. The goals for
187 disease prevention in Healthy People 2020 was focused on the diseases and conditions
188 listed above.²⁹ Healthy People 2020 also introduced Leading Health Indicators,³⁰ which
189 included social determinants of health.

190 In Healthy People 2030, more attention is focused on preventing disease through
191 attention to upstream influences on health, such as social determinants.²⁸ Healthy People
192 2030 continues to emphasize helping people prevent conditions that have a high impact
193 on costs and quality of life, such as chronic disease, behavioral health and equity, or the
194 equal opportunity to be the healthiest a person can be. Pharmacists can encourage and
195 model behaviors to mitigate threats that are high risk to public health such as anthrax,
196 botulism, plague, smallpox, as well as currently emerging diseases spread by viral and
197 bacterial vectors such as Zika, HIV, influenza (e.g., H1N1), and coronaviruses. These

198 behaviors include handwashing, social distancing, mask wearing, immunization, and not
199 working when symptomatic.³¹ Table 2 provides a list of ways to prepare for specific
200 pharmacy public health roles in epidemic or pandemic response.

201 All healthcare professionals, including pharmacists, have become increasingly
202 concerned about the effect of stress on the overall health of people and interested in
203 promoting ways to reduce stress (e.g., regular exercise, yoga, increasing time in nature,
204 comfort animals). As Healthy People stakeholders, pharmacists can use and make their
205 patients aware of available resources and services by providing website links, data,
206 interactive tools, and reports as passive offerings in clinic and community pharmacies.
207 Pharmacists can more actively manage disease prevention through collaborative care
208 agreements, prescribing, therapeutic medication management, and counseling.

209 ***Medication safety.*** Medication safety is one of pharmacists' primary
210 responsibilities.^{32,33} Adverse medication events are estimated to cost the United States
211 more than \$30 billion dollars a year and inflict incalculable loss and suffering on victims.³⁴
212 By providing focused and comprehensive medication instruction to individual patients and
213 groups of patients, pharmacists can help reduce emergency room visits and hospital
214 admissions by up to 30%.³⁴ The pharmacist's role in medication safety and preventable
215 adverse events from medications align with the national public health goals outlined in
216 Healthy People 2030,²⁸ which include reducing emergency department visits for overdoses
217 from medications. Pharmacists are ideally suited to serve in leadership roles as an expert
218 resource for medication safety by virtue of their education and training and their
219 responsibility for ensuring medication safety through use of technologies such as

220 barcoding, computerized provider order entry systems, infusion pumps, and clinical
221 decision support. Pharmacists can improve medication-related processes and develop
222 strong medication-use practices utilizing Just Culture principles³⁵ to facilitate high-
223 reliability organizations³⁶ through engagement in facility-wide committees (e.g.,
224 medication safety or pharmacy and therapeutics committees).^{37,38} Pharmacists can also
225 promote adherence and effective medication use through initiatives in the community and
226 local organizations. The 2013 CAPE outcomes include an increasing role for pharmacists in
227 improving the safety of medications at each step in the medication-use system and in
228 transitions of care.¹⁰ Pharmacists are responsible for monitoring the medication-use
229 system and reporting of medication-related adverse events because of their unique
230 expertise in this area. Pharmacists are often an inherent part of transitions of care (e.g.,
231 through community pharmacies, managed-care facilities, long-term care), so they can play
232 a significant role in ensuring medication safety by counseling patients, identifying potential
233 medication-related adverse drug events, and putting in place strategies to prevent those
234 events (e.g., giving pharmacy colleagues in a setting that a patient is transferring to a
235 heads up and awareness of possible threats to medication safety in specific patients).
236 Pharmacists' ability to problem-solve and decrease future medication-related adverse
237 events is beneficial to public health at large.

238 ***Efforts to address the opioid epidemic.*** ASHP has described roles and
239 responsibilities pharmacists have in substance abuse prevention, education, and
240 assistance¹² and prevention of controlled substances diversion.¹³ The scope and nature of
241 the opioid epidemic warrant particular focus. Healthcare professionals have come to

242 embrace what is termed “pain management and opioid stewardship,” recognizing that
243 “opioid stewardship is an integral... part of an overall pain management and stewardship
244 strategy” and that behavioral and socioeconomic aspects of care should be “recognized as
245 an overarching component that needs to be addressed across the spectrum of patients.”³⁹

246 Pharmacists are well positioned in the healthcare and local communities to collaborate
247 with other providers in the treatment of acute and chronic pain working to apply opioid-
248 alternative therapies when possible. In addition, pharmacists should be engaged to
249 recommend appropriate opioid dosage regimens that decrease overprescribing and
250 reduce the risks of abuse and addiction when necessary. Pharmacists have roles in
251 prevention, intervention, and treatment of opioid abuse and addiction that include but are
252 not limited to the following:

253 ***Prevention***

- 254 ● Collaborating with healthcare colleagues to take an interprofessional approach to
255 pain management and opioid stewardship that incorporates evidence-based non-
256 opioid therapies and reduces the risks of abuse, misuse, and addiction.
- 257 ● Adopting communication and educational approaches to explain dosing
258 instructions to patients in ways that avoid or reduce common problems that stem
259 from opioid misuse or overuse.
- 260 ● Leading efforts to prevent diversion of controlled substances.¹³
- 261 ● Working with other healthcare professionals, governmental agencies, and civic
262 organizations to destigmatize opioid use disorder and foster development of
263 treatment programs.

264 ● Using and advocating for the enhancement of state prescription drug monitoring
265 programs.

266 ● Participating in public substance abuse education and prevention programs.

267 ***Intervention***

268 ● Assisting in the identification of individuals, coworkers, and others who may be
269 having problems related to opioid abuse.

270 ● Dispensing and administering naloxone, and training at-risk patients to self-
271 administer naloxone.

272 ● Working with local school districts to provide programming and encourage peer
273 interventions as well as opportunities for counseling with the pharmacist on
274 options for treatment.

275 ***Treatment***

276 ● Seeking out education and training in the use of medications used in medication-
277 assisted treatment of opioid use disorder (e.g., methadone, buprenorphine,
278 buprenorphine-naloxone, naltrexone).

279 ● Optimizing therapy outcomes by gathering vital clinical and health screening
280 information about patients.

281 Laws regarding the prescribing, dispensing, and use of naloxone have changed dramatically
282 in recent years. By 2019, every state in the U.S. had some form of immediate availability
283 for naloxone in pharmacies.⁴⁰ Healthcare organizations have created training modules for
284 pharmacists on how to use and administer the drug.

285 ***Health education.*** Another way pharmacists advance public health is by

286 developing, promoting, and implementing education programs aimed across life's stages.⁴¹
287 Pharmacists have acted as health educators on a variety of topics (Table 3).⁴²⁻⁵³ In their
288 role as health educators, pharmacists can assess and improve the health literacy of
289 individuals and groups to improve adherence to medication, diet, and exercise regimens;
290 reduce medication-related adverse events; enhance the individual's role in their care and
291 health; and build trust with pharmacists and the healthcare system. Pharmacists who
292 serve as faculty in health professions schools and colleges have a stake in promoting
293 Healthy People 2030. There is a responsibility on their part to integrate strategies on
294 prevention into curricula and interprofessional experiences for the learner. Employing
295 interactive techniques and tools such as games, simulations, and personal fitness devices
296 encourages engagement and commitment by individuals to activities such as exercise and
297 maintaining healthy diets.

298 **Public health policy.** Pharmacists should participate in public health policy
299 development, from local boards of health to national programs.⁵⁴ By linking disease
300 prevalence, medication utilization, and the determinants of disease, pharmacists can place
301 prevention within a larger context. Medication use plays a central role in health and health
302 policy, especially policy directed at chronic disease, which must be formulated with a
303 broad understanding of the relationship between medication therapy and the many other
304 factors that affect disease outcomes. Since medication use increases as patients age,
305 pharmacists' unique perspective on healthcare policy will become more important as the
306 average age of the U.S. population rises.⁵⁵

307 As medication-use experts and experienced health-system administrators, pharmacists

308 can and should contribute to the development of public-health related legislation and
309 regulation and should be involved in public program oversight and administration.
310 Legislators, regulators, and program managers at all levels of government should be
311 educated to utilize this expertise. Pharmacists, as individuals and through their professional
312 associations, state and local boards of health, and state boards of pharmacy, are
313 encouraged to participate in legislative, regulatory, and oversight processes.

314 Pharmacists will need knowledge of the policy and financial drivers of public health to
315 engage in advocacy efforts to improve population outcomes.⁵⁶ To be most effective,
316 pharmacists need to be trained to take leadership roles in public health policy. Postgraduate
317 year 2 pharmacy residencies are now available in Population Health Management and Data
318 Analytics Pharmacy, and dual Pharm.D./M.P.H. degrees are available, as are executive
319 programs in public health practice.

320 ***Research and training.*** Pharmacists should strive to be proficient in research
321 methodology, pharmacoepidemiology, and biostatistics, and how these areas apply to
322 public health decision-making. Pharmacists should actively seek experience in the design,
323 implementation, analysis, and interpretation of clinical studies (both observational and
324 experimental), which can be achieved through both pharmacy curriculum and professional
325 education.

326 Pharmacy curricula should be developed in such a way to include public health,
327 biostatistics, and research design.⁵⁷ Inclusion of the content can help assure that future
328 pharmacists have a strong working knowledge of public health principles as well as
329 population health. It is essential that both experiential and didactic training for students,

330 residents, and research fellows include exposure to research in public health policy,
331 pharmacoepidemiology, pharmacoconomics, health-related quality of life, and evidence-
332 based medicine, with potential opportunities for publication and/or presentation of their
333 work.

334 Professional education of practicing pharmacists may include refreshers on
335 biostatistics, research, and public health trends, with a focus on the application and analysis
336 of research findings in the clinical setting. Mentoring and collaborative research projects
337 across multi disciplines is encouraged.

338 Pharmacists should seek out opportunities to participate in collaborative research.⁵⁸
339 They are also well suited to serve on institutional review boards, medication safety
340 committees, and pharmacy and therapeutics committees. It is recommended that
341 pharmacists work directly with public health policymakers and other key stakeholders (e.g.,
342 leaders in professional organizations, medical centers, academic institutions, governmental
343 agencies, and third-party payers) to learn about processes and to advance their knowledge
344 in order to promote optimal pharmacotherapy.

345

346 **Future Roles**

347 Some of the future roles of pharmacists in public health will look very similar to their
348 current roles. Safe dispensing of drugs will remain a core responsibility of the profession,
349 but changes in laws regarding dispensing will allow pharmacists to proactively dispense
350 knowledge about medications and increase their primary care responsibilities. Pharmacists
351 will continue to provide easy access to vaccinations and partner with other care providers in

352 grassroots public health campaigns, particularly for underserved populations. Pharmacists
353 will remain key healthcare providers in tobacco cessation. As advances in technology make
354 disease screening more accessible, pharmacists will play an increasingly important role in
355 education and screening for conditions such as obesity, hypertension, heart disease,
356 substance abuse, sexually transmitted diseases, and others. With appropriate changes in
357 law and regulation to confer provider status for pharmacists, interpretation of screening
358 test results and referral to other healthcare providers will fall within the pharmacist's
359 responsibilities. Recognition of pharmacists as healthcare providers and reimbursement for
360 their services would also empower pharmacists to screen for food insecurity, physical or
361 sexual abuse, human trafficking, substance use disorders, and mental health issues.

362 Advances in informatics will permit aggregation and application of population and
363 patient-specific data in ways that will encourage development of population-specific,
364 evidence-based screening and disease management programs. Pharmacists should gain
365 awareness of how artificial intelligence can illuminate the relationships between risk
366 factors, prevention, treatment, and patient outcomes to better predict successful
367 interventions. The burgeoning field of pharmacogenomics has already demonstrated its
368 value in patient-focused pharmacotherapy, as genotyping has enabled prescribers and
369 pharmacists to reduce treatment failures and prevent adverse drug reactions in large
370 groups of people. As pharmacogenomics and the rapidly expanding field of population
371 genetics become even more important, pharmacists, as medication-use experts, will apply
372 these new tools not simply to improve patient-specific pharmacotherapy but to advance
373 public health through population health management.

374

375 **Conclusion**

376 Pharmacists play a vital role in maintaining and promoting public health. Pharmacists can
377 improve public health by promoting population health; developing and implementing
378 disease prevention and control programs; advancing medication safety practices; engaging
379 in opioid stewardship; developing health-education policies and programs; advocating for
380 relevant and impactful legislation, regulations, and public policy regarding public health;
381 engaging in public health-related research and education programs; initiating campaigns to
382 disseminate new knowledge; and providing training that includes basic population health
383 tools. All pharmacists have a responsibility to participate in global, national, state, regional,
384 and institutional efforts to promote public health. Pharmacists should integrate the public
385 health practices outlined in this statement into their practices and be empowered by their
386 employers and policymakers to contribute to and improve public health efforts. To more
387 fully utilize their unique expertise, pharmacists should be involved in public health policy
388 decision-making and in the planning, development, and implementation of public health
389 efforts.

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Other Resources

Pharmacists looking for further involvement in public health have many options. First, training and competence in public health disciplines are invaluable for understanding the field of public health and its applications to pharmacy practice. Accredited schools of public health offer traditional didactic classes, and some have courses or continuing

education available on-line that will give the beginner a clearer understanding of the four traditional areas of public health practice: health administration and policy, health education, biostatistics, and epidemiology. Pharmacists who wish to pursue a degree in public health can also do so online at a growing number of schools of public health.

Pharmacists with an interest in federal public health initiatives can start with one of three main points of access. The first is the Centers for Disease Control and Prevention (www.cdc.gov), the largest repository of documents, program descriptions, and contacts in the realm of prevention. Major efforts aimed at disease surveillance, infectious disease control, immunization, health education, chronic disease maintenance, and disease-related data management provide an ample and readily available source of information. The second major source of information is the Office of Disease Prevention and Health Promotion (<https://health.gov/>), which provides access to Healthy People and MyHealthfinder (a personalized screening tool) as well as information about food and nutrition, physical activity, health literacy, and healthcare quality. Finally, the Agency for Healthcare Research and Quality website (www.ahrq.gov) has a section on prevention (<https://www.ahrq.gov/prevention/index.html>) that provides information on a variety of topics as well as access to information from the U.S. Preventive Services Task Force and the Guide to Clinical Preventive Services.

State government websites provide public health information for their respective states. State entities serve as the main policymaking entity for public health priorities and strategies, provide a conduit for federal public health dollars, and are the main repository of health information and data for the state. States often organize a range of advisory groups, task forces, and planning committees whose output shapes their public health agenda. These entities also provide input and direction for state legislative bodies to address, legislate, and fund.

On the local level, boards of health serve as the main government entities involved in public health. Aside from their usual routine of immunizations and restaurant inspections, these boards serve as the policymakers for disaster response and provision of primary care to underserved populations. They receive federal and state dollars that are used to fund public health efforts. They are closest to the general population both in their makeup and in their efforts at improving the public's health. Pharmacists interested in learning more about public health and the types of activities that community public health agencies are involved in can register for a free interactive tutorial at www.nynj-phtc.org/orientation.

Below is a list of websites that provide information related to public health.

Public Health Organizations

- World Health Organization (www.who.int)
- Pan American Health Organization (www.paho.org)
- American Public Health Association (www.apha.org)
- Association of State and Territorial Health Officials (www.astho.org)

- National Association of County and City Health Officials (www.naccho.org)
- Public Health Foundation (www.phf.org)
- Association of Schools of Public Health (www.asph.org)
- Association for Prevention Teaching and Research (www.aptrweb.org/)

Federal Health Agencies

- U.S. Department of Health and Human Services (www.dhhs.gov)
- Office of the Surgeon General, Public Health Reports
(<https://www.hhs.gov/surgeongeneral/reports-and-publications/publichealthreports/index.html>)
- Centers for Disease Control and Prevention (www.cdc.gov)
- Food and Drug Administration (www.fda.gov)
- Health Resources and Services Administration (www.hrsa.gov)
- National Institutes of Health (www.nih.gov)
- Agency for Healthcare Research and Quality (www.ahrq.gov)
- Environmental Protection Agency (www.epa.gov)

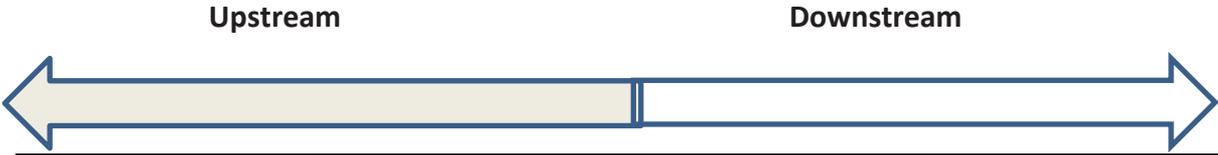
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Table 1. Examples of prevention.



Primordial Prevention (prevent risk factors)	Primary Prevention (prevent illness/injury)	Secondary Prevention (reduce impact)	Tertiary Prevention (chronic impact)
Banning smoking in public areas, smoking education programs	Anti-smoking campaigns, taxes on cigarettes, smoking cessation programs, patches, gum	Treatment for smoking related illness, medical intervention, patient counseling	Disease management, respiratory treatment, therapies and screenings
Eliminating food deserts, nutrition education, healthy cooking classes, dietary guidelines	Increasing access to farmers' markets, health screenings	Individual nutrition counseling, medical intervention for diet-related illness, vitamins	Disease management, health monitoring
Laws and regulations against human trafficking, education regarding human trafficking, establishment of safe internet practices	Establishment of human trafficking hotline, raising awareness among the public, establishment of sentinel reporting, education programs for healthcare providers as well as police officers and other public servants.	Screening for trafficking as part of all healthcare provider interactions, treatment of injuries and illnesses	Establishment of resources and safe havens for victims, mental health counseling
Opioid education programs, safe practices to avoid illness and injury	Improved opioid prescribing policies, opioid disposal locations and policies etc., patient education	Monitoring opioid use (both systemically and individually), early intervention	Medication-assisted therapy, access to treatment centers, monitoring

Table 2. Preparing for Specific Pharmacy Public Health Roles in Epidemic/Pandemic Response^a

Role in Communication and Information		
To prepare for	Cause	Issues
Counseling visitors and family members	Concerned and anxious due to fear of unknown	<ul style="list-style-type: none"> ● Prepare for increased phone calls and directing of family members that come to the facility to visit
Poor or confusing communication or information	Health officials may update information frequently to adjust to evolving situation; different authorities may say conflicting or confusing things	<ul style="list-style-type: none"> ● Communicate and collaborate with institution, local, and/or state Incident Command Centers for coordinated and informed response ● Seek reliable information sources ● Seek local information for current quarantine or treatment recommendations ● Be an advocate for local citizens and be vigilant for emerging issues ● Keep staff well informed through frequent communication via various channels and provide a forum to address questions and concerns
Informing the pharmacy workforce	Information sharing to ensure a ready and engaged workforce	<ul style="list-style-type: none"> ● Stay up to date on the latest information about signs and symptoms, diagnostic testing, and case definitions for the epidemic/pandemic disease ● Share information with pharmacists at other institutions experiencing the same crisis ● Use network groups to keep colleagues at other institutions abreast of new

		<p>information, guidelines, and issues</p> <ul style="list-style-type: none"> ● Perform literature searches and communicate with drug manufacturers to obtain unpublished information on file for emerging and investigational regimens
Role in Supply Chain Management		
To prepare for	Cause	Issues
Challenges securing anticipated stocks of medications and supplies	Supply chain disruption	<ul style="list-style-type: none"> ● Report unusual sales volumes for medications or patient complaints ● Determine mechanisms for obtaining drugs not available on market (e.g., emerging investigational therapies) during regular and off-hours ● Report supply chain issues (e.g., drug shortages, PPE) to key facility staff and contact local/state health departments
Role in Pharmacy Operations		
To prepare for	Cause	Issues
Supplying rapid response kits	Timely access to treatment	<ul style="list-style-type: none"> ● For supportive care and as investigational therapies emerge, prepare rapid response kits containing information such as management algorithms, drug dosing and administration guidelines, and pharmacist contact numbers ● Make kits available in relevant patient care units such as emergency departments and intensive care units
Leadership in medication use	Safe patient care	<ul style="list-style-type: none"> ● Ensure that appropriate

and safety		education and drug administration and dosing guidelines are available to guide medical, nursing, and pharmacy staff
Role in Infection Prevention and Control		
To prepare for	Cause	Issues
Requests to dispose of potentially contaminated medications and supplies	Family members of potential disease cases may have unused medications they want to throw away	<ul style="list-style-type: none"> Determine local/state health department recommendations for disposing of unused medication products and supplies that have been dispensed to a patient
Updating policies and procedures	Integrity of drug supply	<ul style="list-style-type: none"> Develop or revise policies and procedures pertaining to drug delivery to meet infection control precautions
Protecting workforce from exposure	<ul style="list-style-type: none"> Healthcare workers are more likely to become infected if they work closely with patients with infectious diseases Limiting exposure time and closeness can help prevent infection 	<ul style="list-style-type: none"> Orient and education workforce regarding infection control precautions Use standard respiratory precautions Handle items associated with potentially exposed patients while wearing gloves Frequent hand washing Use face masks if counseling symptomatic patients Ensure that appropriate pharmacy staff have been medically cleared, fit-tested, and trained for respirator use Use telephone for counseling Drop off prescriptions at home Bill via credit card to avoid

		handling checks or money
Monitoring pharmacy staff	Fever, cough, and shortness of breath are early signs and symptoms of some infectious diseases.	<ul style="list-style-type: none"> ● Be prepared to take temperature of workers once a shift ● If fever, cough, and shortness of breath are present, send worker to designated treatment site ● If a family member is sick, put employee on sick leave ● Notify occupational health services

Role in Patient Care

To prepare for	Cause	Issues
Patient/visitor surge	Patients may seek other sources of care and information if local hospitals closed or under quarantine	<ul style="list-style-type: none"> ● Adjust staffing to handle increased traffic, phone calls, and other electronic communications (e.g., social media) ● Manage staff to accommodate revised or expanded responsibilities with appropriate sleep/rest cycles ● Prepare information for patients/visitors for education and awareness programs ● Report patient surges to key facility staff and public health officials
Treating sicker patients	Patients may be sicker than usual but barred from hospitals	<ul style="list-style-type: none"> ● Review latest CDC information for education and awareness programs ● Help triage patients in accordance with institution emergency preparedness plan ● Inform key facility staff and contact local/state health departments for latest guidance and instructions (e.g., home quarantine)

Caring for the worried well	Patients who have respiratory symptoms but no history of exposure	<ul style="list-style-type: none"> ● Provide information and reassurance through education and awareness programs ● Remind patients to get other appropriate vaccines
Requests for ineffective prevention and treatment options	Remedies for self-treating a disease may be requested by patients even though they are not effective	<ul style="list-style-type: none"> ● Provide patients with most current treatment and prevention information.
Team-based care	Interprofessional expertise needed	<ul style="list-style-type: none"> ● Collaborate with key players (e.g., microbiologist) and communicate on interprofessional issues needed to optimize patient care ● Be proactive and flexible in assuming new responsibilities within a pharmacist's scope of practice

^aSource: Adapted from Tables 3.5 and 3.6 in Carter J, Slack M. *Pharmacy in Public Health: Basics and Beyond*. ASHP: Bethesda, MD; 2009.

Table 3. Examples of patient education programs, goals, methods, and alignment with Healthy People 2030 goals.

Patient Education Programs	Goals	Method	Aligns with Healthy People 2030 goal
Birth Control ⁴²	Provide Womens Health services	Individual	Yes
Chronic Disease	Education Prevention Management	Individual Group Special Populations	Yes
Immunization ^{43,44}	Prevention Reduce epidemics Provide services Improve health of a nation	Individual Group Special Populations Community Awareness	Yes
Medication Safety ^{45,46}	Improve Patient Outcome Improve Health Literacy	Individual Health Literacy Assess Group Special Populations Community Awareness	Yes
Mental Health ^{47,48}	Reduce Stigma Direct individual to services Provide services Prevention	Individual Group Special Populations Community Awareness	Yes
Nutrition	Reduce disease Reduce cost to health system Better individual Health	Individual Group Community Awareness	Yes
Oral Chemotherapy ⁴⁹	Improve Patient Outcome	Individual	
Substance Abuse ^{50,51}	Prevention Direct individual to services Provide services Improve health of a nation	Individual Groups Special Populations Community Awareness Flyers or Brochures	Yes
Tobacco Cessation ⁵²	Reduce disease Reduce cost to health system Better individual Health	Individual Group Resources	Yes
Resources ⁵³	Improve Literacy and Guide to	Individual	

	Resources and Support for: Human Trafficking Partner and Child Abuse Community Wellness Services	Groups Brochures and Flyers	
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